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# TRENDS IN CALIFORNIA LIVESTOCK

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## AND POULTRY PRODUCTION,

## CONSUMPTION, AND FEED USE:

## 1961-1978

Division of Agricultural Sciences  
UNIVERSITY OF CALIFORNIA

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TRENDS IN CALIFORNIA LIVESTOCK AND POULTRY PRODUCTION,  
CONSUMPTION, AND FEED USE: 1961-1978

by

G. A. King\*, J. C. Fitz\*\*, C. M. Warner\*\*\*, and A. C. Bywater\*\*\*\*

\* Professor, Department of Agricultural Economics, University  
of California, Davis.

\*\* Assistant Economist, California Department of Water Resources.

\*\*\* Formerly Associate Economist, California Department of Water Resources.

\*\*\*\* Assistant Professor and Nutritionist in the Experiment Station,  
University of California, Davis.

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## FOREWORD

The purpose of this report is to provide an overview of the feed-livestock economy of California during the period 1961 to 1978. It is a joint report by economists in the Department of Water Resources and by economists and animal nutritionists at the University of California, Davis. This study will be followed by two other reports by others dealing more explicitly with factors affecting the future of the livestock and poultry industries, with projections of these industries, and with the related land and water requirements.

This research is based partly on previously published and unpublished reports on the feed-livestock economy of California. An analysis of feed use in 1961-65 by Snider and King [1970] is the basis for the current analysis. Important information for that report was provided in a California Department of Agriculture report by Thomas and Braun [1965], which presented livestock and poultry rations developed in cooperation with specialists at the University. Projections of feed and livestock use for 1985 were developed by King, Carter, and Dudek [1977], building, in part, on a study by Mel Warner of the Department of Water Resources. The present study revised previous estimates to provide a consistent basis for comparison between 1961-65 and 1974-76. This report will then form the basis for analyzing future trends in feed and livestock production to be presented in subsequent reports. We wish to express our thanks to the careful review comments on earlier drafts of this report, particularly by Jerry Foytik. Also, appreciation is given to Beth Connelly for typing the table-laden manuscript.

## SUMMARY

The California feed-livestock and poultry sectors are a vital part of the state's agriculture. In this summary, we highlight the major findings of the report which trace past trends in these industries from 1961 to 1978. Detailed analysis is given of feed use by livestock and poultry during the periods 1961-1965 and 1974-1976.

Land and Water

1. In 1975, an estimated 42 percent of total water applied for agriculture was used to produce livestock feed, including grain (2.7 million acre-feet), hay (5.6 million acre-feet) and irrigated pasture (5.2 million acre feet), -- 13.5 million acre-feet for these uses out of a total of 31.7 million acre-feet for irrigated agriculture.
2. Land allocable to production of livestock feed in 1975 included 1,665,000 acres of grain, 1,650,000 acres of hay, 1,200,000 acres of irrigated pasture plus use of 35,968,000 acres of range land. The use of land for grain production is related to the relative profitability of alternative crops and the importance of grain in crop rotations.
3. The 1975 irrigated acreage for livestock feed is estimated at 3,632,000 acres, or 41 percent of the total irrigated acreage in the state.

Feed Concentrates

1. Livestock and poultry used an average of 8.7 million tons of feed concentrates annually in 1974-1976, compared with

annual use of 7.0 million tons in 1961-1965. The 1.7 million ton increase was about half grain and half by-product feeds.

2. Feed grain production was practically equal for the two periods at 2.6 million tons. Wheat production increased sharply from 259,000 tons to 1,544,000 tons, but feed use of wheat increased marginally due to a strong export market during the 1974-1976 period.
3. Shipments of feed grains into California exceed local production, and the increased levels of grain use is reflected in these inshipments. Analysis of the state's livestock and poultry industries must consider its competitive position, as compared with other regions, both in grain and livestock production.
4. By-product feed production has increased during the past two decades, as have inshipments of feeds such as soybean meal and molasses.
5. Beef cattle and poultry each consume about 3.0 million tons of feed concentrates; dairy cattle, about 2.4 million tons; and only minor amounts used for hog and sheep production.

#### Hay and Pasture

1. Alfalfa hay production averaged 6.7 million tons in 1974-1976; other hay, 0.7 million tons--a three percent increase in total hay production since the 1961-65 period.



2. Dairy cattle used 5.9 million tons of hay annually and beef cattle, 2.0 million tons. Only minor amounts of hay were used for sheep and lambs.
3. Irrigated pasture and range land contribute an estimated 26.5 million animal unit months of grazing, allocated among beef cattle (74 percent), dairy cattle (16 percent), and sheep and lambs (10 percent).
4. Range land provided an economic return from livestock grazing estimated at 204 million dollars in 1973, according to a study by A. D. Reed [1974].

#### Livestock and Poultry Products

1. U.S. consumers allocate almost half of their at-home food expenditures for livestock and poultry products. Expenditures on individual commodities may vary over time, associated with changes in prices, real income levels, and tastes and preferences.
2. California production of lamb, eggs, and turkey meat exceeds local consumption of these products. Other regions, however, provide an estimated 51 percent of beef consumed in the state, 98 percent of the pork and about 60 percent of the poultry meat. Some dairy products, such as cheese, may be shipped into California but consumption of most dairy products is met from local production.
3. The future levels of production of livestock and poultry products depend on a complex set of factors associated with feed conversion efficiency and interregional

considerations relating to intermediate product (e.g., feeds) and final product (meat) production and demand. These outcomes then determine the derived demand for water and land used in production. This study hopefully provides useful information on some aspects of the framework needed for a more complete analysis of the feed-livestock economy, and the derived demand for land and water.

## INTRODUCTION

Any economic analysis of the future of the California feed-livestock economy must first consider past developments in the industry. The major purpose of this report is to provide such background information on livestock and poultry production, the sources and uses of feed grains, by-products and roughage by type of livestock, and the related land and water used in this production. Subsequent reports will provide projections of California production under specified conditions as to resource availability, technology, and interregional competition.

The trend analysis covers the period from 1961 to 1978, with detailed feed-livestock analyses for 1961-65 and 1974-76. The comparison periods are selected to avoid unusual situations associated with a particular year. For certain products, in particular cattle, the years may not be entirely representative due to cyclical production adjustments; however, basic data are provided in the appendix to allow qualitative adjustments to these base periods when making projections of future developments.

The report provides, first, a review of the demand for livestock and poultry products, with emphasis on U.S. per capita consumption trends for major categories. Detailed information on California consumption is not available, but some information for selected years is given. Next, California livestock and poultry production trends are reviewed, followed by a review of trends in the feed supply and estimated utilization by livestock and other uses. The major analysis relates the feed supply to use by

various types of poultry and livestock. A summary is given of the land and water used in livestock feed production in California.

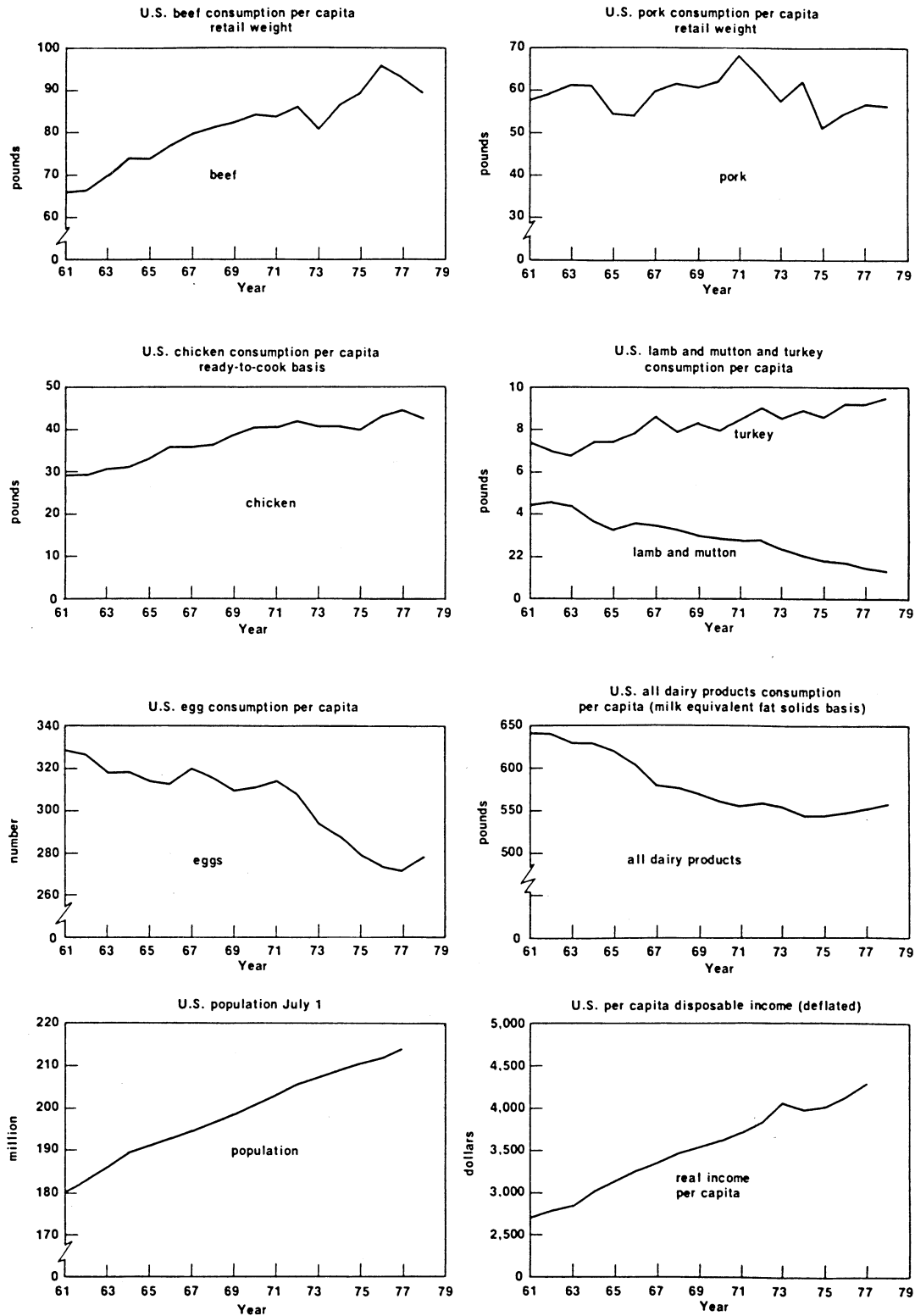
#### THE DEMAND AND SUPPLY OF LIVESTOCK AND POULTRY PRODUCTS

##### Demand

U.S. consumers allocate almost half of their at-home food expenditures for livestock and poultry products. In 1972, 48.3 percent of the consumer's food dollar was for purchases of red meats (27.7 percent), poultry meats (4.3 percent), eggs (2.4 percent) and dairy products (13.9 percent), as reported by Salathe [1979]. Expenditures on individual commodities may change over time due to changes in relative prices, real income levels, and tastes and preferences.

Trends in U.S. per capita consumption of major items are shown in Figure 1 for the period 1961 to 1978. Beef, chicken, and turkey meat consumption has increased markedly whereas pork consumption has shown considerable variation associated with cyclical supply response. Per capita consumption of lamb, eggs, and all dairy products each has decreased considerably over the past two decades. A detailed analysis of individual dairy products would show divergent trends within the aggregate, with cheese consumption increasing and consumption of products such as condensed and evaporated milk trending downward. Per capita consumption is influenced by changes in real income, prices, and tastes. Consumers have elected to spend less of their total expenditures on food over this period; 16.8 percent was allocated to food (at home and away from home) in 1976, as compared with 19.9 percent in 1961. Total demand for food depends also on the population

Figure 1  
Trends in U.S. Per Capita Consumption of Selected Livestock and Poultry Products  
and in U.S. Population and Real Income Per Capita, 1961-1978



Source: U.S. Economics, Statistics and Cooperations Services (1979)

level which increased from 180 million in 1961 to about 215 million in 1978.

California consumption trends are not available since information is not available on quantities shipped into and out of the state. It is reasonable to assume that California trends in per capita consumption parallel those for the U.S. for most commodities. There is evidence from occasional surveys, however, that the level of per capita consumption may differ by region. For example, in 1965 the average Western consumer ate more beef and eggs and less pork and chicken than the average U.S. consumer.

#### Supply

The U.S. supply of livestock and poultry products is mainly from domestic sources; however, nonfed beef and lamb meat imports were about seven percent of production in 1974-76. Exports accounted for about three percent of chicken and turkey meat production in this period. There is trade in other products but imports are about equal to exports (see U.S. ESCS [1978]).

California is dependent on shipments from other states particularly for beef, pork, and broiler meat. We estimate that in 1971 California obtained from other areas 51 percent of its carcass beef, 98 percent of its pork, and about 60 percent of its poultry meat (see Table 1). It is estimated that some dairy products such as cheese are shipped into California, but the lamb, eggs, and turkey meat are exported from the state to other parts of the nation.

Table 1

## Sources of California Beef, Pork and Broiler Supplies, 1971

| Source                              | Beef supply    |                     | Pork supply      |                     | Broilers and fryers  |                     |
|-------------------------------------|----------------|---------------------|------------------|---------------------|----------------------|---------------------|
|                                     | Dressed weight | Percentage of total | Dressed weight   | Percentage of total | Ready-to-cook weight | Percentage of total |
|                                     | million pounds | percent             | million pounds   | percent             | million pounds       | percent             |
| California slaughter                |                |                     | -- <sup>a/</sup> | --                  | --                   | --                  |
| California feedlots                 | 1,208          | 43.4                |                  |                     |                      |                     |
| Other California sources            | 169            | 6.0                 | 25.1             | 2.5                 | 257                  | 42                  |
| Inshipments for immediate slaughter | <u>356</u>     | <u>12.8</u>         | <u>217.6</u>     | <u>21.9</u>         | <u>--</u>            | <u>--</u>           |
| TOTAL                               | 1,733          | 62.2                | 242.7            | 24.4                | 257                  | 42                  |
| Meat inshipments                    | 913            | 32.8                | 719.9            | 72.3                | 351                  | 58 <sup>b/</sup>    |
| Imports                             | <u>139</u>     | <u>5.0</u>          | <u>33.1</u>      | <u>3.3</u>          | <u>--</u>            | <u>--</u>           |
| TOTAL Supply                        | 2,785          | 100.0               | 995.7            | 100.0               | 608                  | 100                 |

<sup>a/</sup> Dashes indicate data not relevant.

<sup>b/</sup> Includes only truck receipts of fryers in the San Francisco and Los Angeles areas. We estimate total inshipments may equal as much as 70 percent of total supply.

Sources: Beef inshipments and imports: James H. Cothern, Demand and Supply of Beef for California Markets, Davis: California Agricultural Extension AXT-381, August 1973.

Slaughter and California feedlots: estimated dressed weight of 607 pounds per animal.

Pork Supply: James A. Cothern, "Economic Problems and Opportunities for California Pork Producers," Davis: California Agricultural Experiment Service paper presented January 25, 1974.

Broilers and fryers: see Appendix Table C-8.

## CALIFORNIA FEED SUPPLY AND UTILIZATION

Feed Concentrates

California livestock and poultry producers used an estimated 8.5 million tons of feed concentrates in 1974-76 (see Table 2). This aggregate consisted of feed grains (58 percent), wheat (2 percent), high-protein by-product feeds (12 percent) and other by-product and supplements (28 percent). Here, a brief review is given of a few important aspects of this feed supply and utilization.

Feed grains

An important aspect of the California industry is its dependence on feed grains produced in other states. Shipments into California of 3.0 million tons in 1974-76, exceeded California's production of 2.6 million tons. In 1961-65, California production was about the same as in 1974-76 (2.6 mil. tons), but in shipments were only 2.1 million tons. Thus, the increase in feed grains used by livestock between these periods was accomplished by in shipments rather than by local production.

The composition of both feed grain production and in shipments has changed over time, with corn production and use increasing rapidly and barley and grain sorghums decreasing in relative importance. Such changes are related to uneven technological developments among grains, to the composition of the livestock-poultry inventory, and to supply response by region in



Table 2

Feed Concentrates: California Supply and Distribution,  
1961-65 Average and 1974-76 Average

| Item                   | Supply                        |            |                            |                 | Distribution <sup>a/</sup>      |         |      |                      |                   |
|------------------------|-------------------------------|------------|----------------------------|-----------------|---------------------------------|---------|------|----------------------|-------------------|
|                        | Beginning stocks<br>January 1 | Production | Imports and<br>inshipments | Total<br>supply | Ending<br>stocks<br>December 31 | Exports | Seed | Food and<br>industry | Livestock<br>feed |
| 1,000 tons             |                               |            |                            |                 |                                 |         |      |                      |                   |
| <u>1961-65 average</u> |                               |            |                            |                 |                                 |         |      |                      |                   |
| <u>Grain</u>           |                               |            |                            |                 |                                 |         |      |                      |                   |
| Barley                 | 647                           | 1,755      | 204                        | 2,606           | 641                             | 78      | 71   | 109                  | 1,707             |
| Corn                   | 121                           | 233        | 446                        | 800             | 129                             | 16      | 1    | 46                   | 608               |
| Grain sorghum          | 785                           | 494        | 1,419                      | 2,698           | 646                             | 219     | 2    | —                    | 1,831             |
| Oats                   | 33                            | 92         | 42                         | 167             | 33                              | —       | 16   | 4                    | 114               |
| Total                  | 1,586                         | 2,574      | 2,111                      | 6,271           | 1,449                           | 313     | 90   | 159                  | 4,260             |
| Wheat                  | 259                           | 259        | 557                        | 1,075           | 256                             | 145     | 14   | 512                  | 148               |
| All grain              | 1,845                         | 2,833      | 2,668                      | 7,346           | 1,705                           | 458     | 104  | 671                  | 4,408             |
| <u>By-products</u>     |                               |            |                            |                 |                                 |         |      |                      |                   |
| High protein           | — <sup>b/</sup>               | 603        | 186                        | 901             | —                               | —       | —    | —                    | 901               |
| Other                  | —                             | 1,323      | 453                        | 1,776           | —                               | 227     | —    | —                    | 1,549             |
| Total                  | —                             | 2,038      | 639                        | 2,677           | —                               | 227     | —    | —                    | 2,450             |
| TOTAL                  | 1,845                         | 4,871      | 3,307                      | 10,023          | 1,705                           | 685     | 104  | 671                  | 6,858             |
| <u>1974-76 average</u> |                               |            |                            |                 |                                 |         |      |                      |                   |
| <u>Grain</u>           |                               |            |                            |                 |                                 |         |      |                      |                   |
| Barley                 | 388                           | 1,301      | 330                        | 2,019           | 427                             | —       | 59   | 100                  | 1,433             |
| Corn                   | 374                           | 797        | 1,424                      | 2,595           | 421                             | 123     | 4    | 82                   | 1,965             |
| Grain sorghum          | 178                           | 419        | 1,132                      | 1,729           | 150                             | 150     | 2    | —                    | 1,427             |
| Oats                   | 21                            | 70         | 72                         | 163             | 21                              | —       | 17   | 10                   | 115               |
| Total                  | 961                           | 2,587      | 2,958                      | 6,506           | 1,019                           | 273     | 82   | 192                  | 4,940             |
| Wheat                  | 349                           | 1,544      | 897                        | 2,790           | 500                             | 1,322   | 55   | 712                  | 201               |
| All grain              | 1,310                         | 4,131      | 3,855                      | 9,296           | 1,519                           | 1,595   | 137  | 904                  | 5,141             |
| <u>By-products</u>     |                               |            |                            |                 |                                 |         |      |                      |                   |
| High protein           | —                             | 633        | 360                        | 993             | —                               | —       | —    | —                    | 993               |
| Other                  | —                             | 1,774      | 810                        | 2,584           | —                               | 198     | —    | —                    | 2,386             |
| Total                  | —                             | 2,407      | 1,170                      | 3,577           | —                               | 198     | —    | —                    | 3,379             |
| TOTAL                  | 1,310                         | 6,538      | 5,025                      | 12,873          | 1,519                           | 1,793   | 137  | 904                  | 8,520             |

a/ Seed use is estimated based on seeding rates and planted acreage. Food and industry use also is estimated based on various industry sources.

b/ Dashes indicate data are not available.

Sources: Grain: Federal-State Market News Service [1979]  
By-products: see Table 3

the U.S. Also, the dynamics of export demand may influence yearly changes in production of individual grains. These grains are generally substitutable, within limits, on the basis of net energy content. Thus, the major factors associated with long-term changes in individual feed grain use are related to technology of production, interregional competition, and to some extent the composition of the California livestock and poultry production.

#### Wheat

California production has increased markedly over the past two decades, associated with the introduction of new high-yielding varieties and a strong export demand. Feed use is of minor importance in California due to more favorable returns in flour milling and other food uses.

#### By-product feeds

High-protein by-product feeds include such items as soybean meal, cottonseed and other oilseed meal, fish meal and meat scraps and meal. These feeds are particularly important in poultry rations and as protein supplements in some livestock rations. California produces about two-thirds of its high protein by-product feed requirements (see Table 3). The data on high-protein and other by-product feeds, however, are not reported as accurately as for feed grains, and probably underestimate available supplies.

Other supplements include alfalfa meal and pellets, dried beet pulp, fats, millfeeds, molasses, and mineral and vitamin supplements. About 75 percent of such feeds are produced in California. The availability of a wide variety of by-product feeds and roughages in California is an important reason for the location of certain livestock industries

Table 3

By-Product Feeds: California Supply and Distribution,  
1961-65 Average and 1974-76 Average

| Item                      | 1961-65           |                                 |              |                   |                                       | 1974-76      |                                 |              |            |                                       |
|---------------------------|-------------------|---------------------------------|--------------|-------------------|---------------------------------------|--------------|---------------------------------|--------------|------------|---------------------------------------|
|                           | Production        | Imports<br>and rail<br>receipts | Supply       | Exports           | Available<br>for livestock<br>feeding | Production   | Imports<br>and rail<br>receipts | Supply       | Exports    | Available<br>for livestock<br>feeding |
|                           | 1,000 tons        |                                 |              |                   |                                       | 1,000 tons   |                                 |              |            |                                       |
| <u>High protein</u>       |                   |                                 |              |                   |                                       |              |                                 |              |            |                                       |
| Cottonseed meal           | 327               | <u>a/</u>                       | 327          | —                 | 327                                   | 291          | —                               | 291          | —          | 291                                   |
| Fish meal and products    | 21 <sup>b/</sup>  | 59 <sup>c/</sup>                | 80           | —                 | 80                                    | 43           | 9                               | 52           | —          | 52                                    |
| Meat scraps and meal      | 177               | —                               | 177          | —                 | 177                                   | 139          | —                               | 139          | —          | 139                                   |
| Soybean meal              | —                 | 127                             | 127          | —                 | 127                                   | —            | 351                             | 351          | —          | 351                                   |
| Other <sup>d/</sup>       | 190               | —                               | 190          | —                 | 190                                   | 160          | —                               | 160          | —          | 160                                   |
| Total                     | <u>715</u>        | <u>186</u>                      | <u>901</u>   | <u>—</u>          | <u>901</u>                            | <u>633</u>   | <u>360</u>                      | <u>993</u>   | <u>—</u>   | <u>993</u>                            |
| <u>Other supplements</u>  |                   |                                 |              |                   |                                       |              |                                 |              |            |                                       |
| Alfalfa pellets and meal  | 406 <sup>c/</sup> | —                               | 406          | 227 <sup>e/</sup> | 179                                   | 337          | —                               | 337          | 198        | 139                                   |
| Dried beet pulp           | 290               | —                               | 290          | —                 | 290                                   | 445          | —                               | 445          | —          | 445                                   |
| Fats                      | 100               | —                               | 100          | —                 | 100                                   | 185          | —                               | 185          | —          | 185                                   |
| Millfeeds, wheat and rice | 220               | 103 <sup>f/</sup>               | 323          | —                 | 323                                   | 305          | 260                             | 565          | —          | 565                                   |
| Minerals and vitamins     | 115               | —                               | 230          | —                 | 230                                   | 200          | 200                             | 400          | —          | 400                                   |
| Molasses                  | 192               | 235                             | 427          | —                 | 427                                   | 302          | 350                             | 652          | —          | 652                                   |
| Total                     | <u>1,323</u>      | <u>453</u>                      | <u>1,776</u> | <u>227</u>        | <u>1,549</u>                          | <u>1,774</u> | <u>810</u>                      | <u>2,584</u> | <u>198</u> | <u>2,386</u>                          |
| TOTAL                     | 2,038             | 639                             | 2,677        | 227               | 2,450                                 | 2,407        | 1,170                           | 3,577        | 198        | 3,379                                 |

a/ Dashes indicate data not available.

b/ 1962-65 average.

c/ 1963-65 average.

d/ Includes such meals as copra, linseed, corn gluten, feather, brewers dried grains, and dried milk products. Production levels are rough estimates based on various industry sources.

e/ 1964-65 average.

f/ 1965.

Sources: Cottonseed meal production, fish meal production and imports, soybean meal rail receipts, alfalfa pellet and meal production and exports and millfeed rail receipts: Federal-State Market News Service, Feedstuff Prices in California, Monthly and Yearly Averages, 1959-1967, 1973-1977, Sacramento (processed).  
(Sources continued on next page)

(Table 3 sources continued)

Meat meal and scraps production was estimated by applying the California proportion of U.S. commercial cattle slaughter (Livestock and Meat Statistics, U.S. Economics, Statistics and Cooperative Services [1977]) to reported U.S. production of meat meal and tankage, Feed Situation, FdS-267, U.S. Economics Research Service [1977].

Dried beet pulp production is estimated as the California share of sugar beet production multiplied by the reported U.S. use of dried beet pulp used in animal feeding reported in the Feed Situation, (see above reference) U.S. Economic Research Service [1977].

Fat used as annual feed is derived from typical rations for the respective periods.

Millfeed production includes only wheat and rice. California wheat millfeed production is reported in Current Industrial Reports, Flour Milling Products, U.S. Bureau of the Census [1977]. California rice millfeed is estimated by applying California's percent of U.S. rice production to U.S. rice millfeed production as reported in the Feed Situation, U.S. Economic Research Service [1977].

Minerals and vitamins use is based on typical livestock and poultry rations and estimates of numbers fed. California production is estimated at 50 percent of that fed.

Molasses production refers to beet molasses only. U.S. beet molasses production is reported in Molasses Market News, U.S. Agricultural Marketing Service [1977]. California production is estimated by applying the proportion of that state's sugar beet production to U.S. beet molasses production.

in the state. However, it was noted previously that the level of feeding is dependent on feeds shipped in from other areas, under current economic conditions.

#### Hay and Roughage

California hay production was 7.6 million tons in 1974-76, of which 87 percent was alfalfa and the remainder was grain and other hay (see Table 4). Some hay is shipped into California, mainly from Nevada, which added 173 thousand tons to supplies in this period. California exports alfalfa as pellets (198 thousand tons) and hay cubes (71 thousand tons). Production of hay cubes is not reported.

There are various roughages utilized by livestock, as noted in the rations given in Appendix B. These include corn and sorghum silage for which production is reported (see Table 4) and straw, cottonseed hulls, and other forages for which production is not reported. Corn silage production in California has increased markedly in recent years.

Another important feed source is irrigated pasture and range land. Production is difficult to estimate, but a rough estimate of animal unit requirements is noted in the following section.

#### ESTIMATED FEED USE BY TYPE OF LIVESTOCK AND POULTRY

The purpose of this section is to present estimates of feed used by individual types of livestock and poultry. The procedure is to: (1) calculate the numbers of poultry and livestock fed annually in the two comparison periods; (2) obtain from various sources typical rations by type of livestock; and (3) calculate the estimated concentrates fed per

Table 4

Hay and Silage: California Supply and Distribution,  
1961-65 Average and 1974-76 Average

| Item          | 1961-65    |                         |                   |       | 1974-76    |                         |                   |       |
|---------------|------------|-------------------------|-------------------|-------|------------|-------------------------|-------------------|-------|
|               | Production | Shipped into California | Exported          | Fed   | Production | Shipped into California | Exported          | Fed   |
|               | 1,000 tons |                         |                   |       | 1,000 tons |                         |                   |       |
| <u>Hay</u>    |            |                         |                   |       |            |                         |                   |       |
| Alfalfa       | 6,223      | 167 <sup>a/</sup>       | 227 <sup>b/</sup> | 6,163 | 6,664      | 173 <sup>c/</sup>       | 269 <sup>d/</sup> | 6,568 |
| Grain         | 740        | — <sup>e/</sup>         | —                 | 740   | 600        | —                       | —                 | 600   |
| Other         | 446        | —                       | —                 | 446   | 366        | —                       | —                 | 366   |
| Total         | 7,409      | 167                     | 227               | 7,349 | 7,630      | 173                     | 269               | 7,534 |
| <u>Silage</u> |            |                         |                   |       |            |                         |                   |       |
| Corn          | 1,305      | —                       | —                 | 1,305 | 3,265      | —                       | —                 | 3,265 |
| Sorghum       | 252        | —                       | —                 | 252   | 179        | —                       | —                 | 179   |
| Total         | 1,557      | —                       | —                 | 1,557 | 3,444      | —                       | —                 | 3,444 |

a/ 1963-65 average.

b/ 1963-64 average (pellets).

c/ Excludes shipments from Arizona

d/ Alfalfa pellets and meal (see Table 3)

e/ Dashes indicate data are not available.

Sources: Hay: Federal-State Market News Service [1978].

Silage: California Crop and Livestock Reporting Service [1979].

year so that the total is approximately equal to the aggregate available for feeding given in the previous section of this report. We wish to emphasize that this procedure is subject to error, since typical rations can be only approximated for state-wide feeding conditions, and data on weight gains in feedlots, for example, are not reported and should be treated as rough estimates. (See Appendix Tables B-2 and B-3).

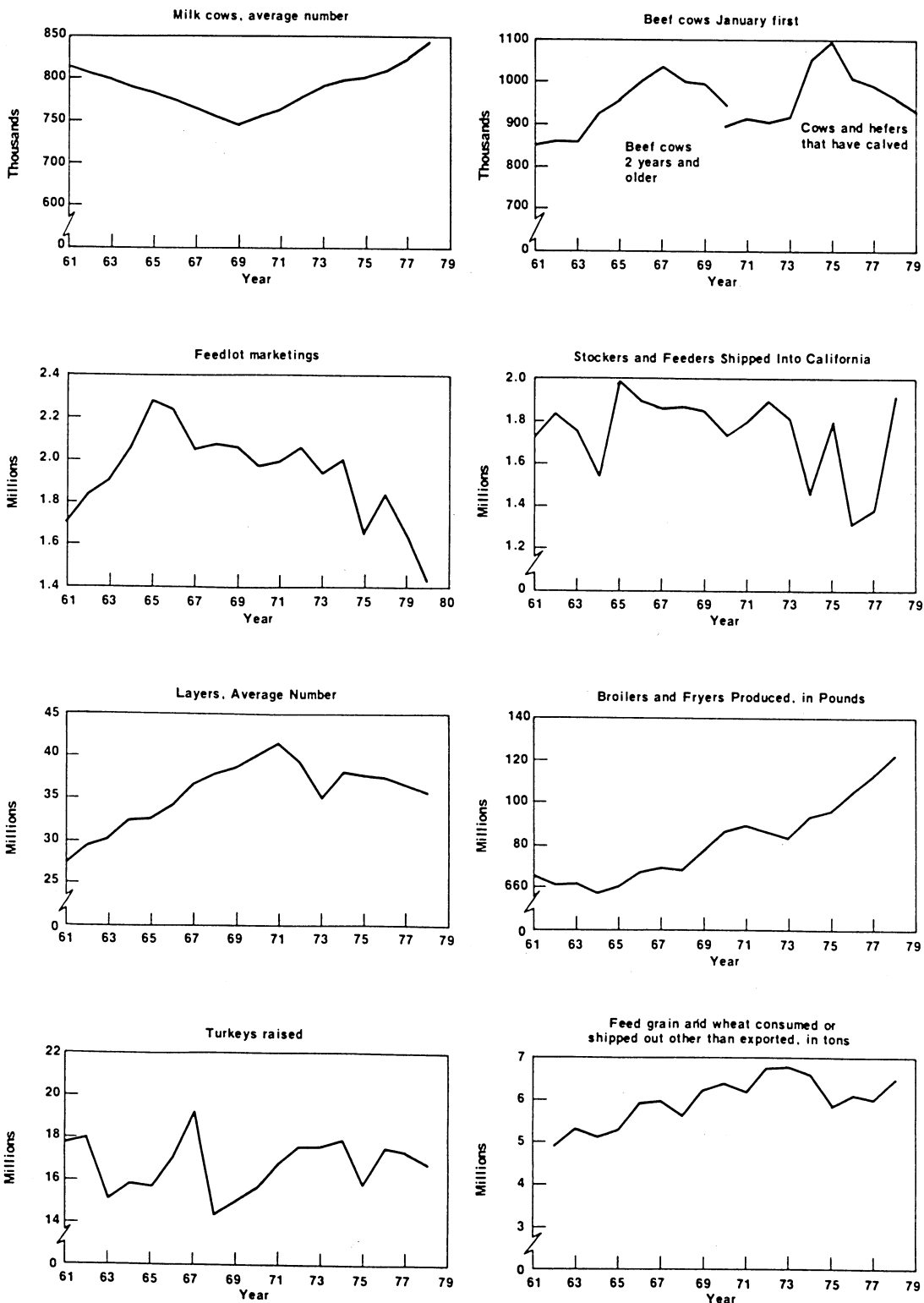
Before presenting results for individual types of livestock, a brief summary is given of aggregate feed use and trends in livestock numbers.

#### Aggregate Feed Use

The demand for feed is derived from the demand for livestock and poultry produced in California. Trends in numbers, shown in Figure 2, give one indication of changes over time. Other factors include the level of feeding related to milk production per cow, for example, and changes in feed conversion efficiency.

The estimated aggregates of concentrates, roughage and pasture used by livestock and poultry are shown in Table 5. These aggregates exclude amounts fed to horses, pets and rabbits. The total amount of grain fed, calculated in detail using rations and animal numbers (discussed subsequently), corresponds closely to that shown previously (Table 2) for grain available for livestock feed. Estimates of by-products fed, using typical rations, exceed reported available supplies by about two percent. One only has to inspect a list of by-product feeds in a least-cost dairy or beef cattle ration, however, to realize that many feeds are not reported and thus are not included in the Table 3 aggregate.

Figure 2  
Trends in California Livestock and Poultry Numbers and in Feed Grains  
1961-1978



Source: See Appendix C.



Table 5

Estimates of Feed Concentrates, Hay and Pasture Used by  
Livestock and Poultry: California,  
1961-65 and 1974-76 Averages

| Item                   | Concentrates |              |              | Hay or hay<br>equivalent | Pasture   |
|------------------------|--------------|--------------|--------------|--------------------------|-----------|
|                        | Grain        | By-products  | Total        |                          |           |
|                        | 1,000 tons   |              |              |                          | 1,000 AUM |
| <u>1961-65 average</u> |              |              |              |                          |           |
| Dairy cattle           | 618          | 872          | 1,490        | 4,967                    | 6,705     |
| Beef cattle            | 1,760        | 862          | 2,622        | 1,765                    | 16,900    |
| Sheep and lambs        | 7            | 1            | 8            | 16                       | 4,877     |
| Hogs                   | 109          | 18           | 127          | 0                        | 0         |
| Poultry                | <u>1,840</u> | <u>923</u>   | <u>2,763</u> | <u>0</u>                 | <u>0</u>  |
| Total                  | 4,334        | 2,676        | 7,010        | 6,748                    | 28,482    |
| <u>1974-76 average</u> |              |              |              |                          |           |
| Dairy cattle           | 884          | 1,502        | 2,386        | 5,879                    | 4,407     |
| Beef cattle            | 2,033        | 937          | 2,970        | 1,995                    | 19,465    |
| Sheep and lambs        | 5            | a/           | 5            | 11                       | 2,583     |
| Hogs                   | 84           | 16           | 100          | 0                        | 0         |
| Poultry                | <u>2,144</u> | <u>1,074</u> | <u>3,218</u> | <u>0</u>                 | <u>0</u>  |
| Total                  | 5,150        | 3,529        | 8,679        | 7,885                    | 26,455    |

a/ Less than 1,000 tons.

Source: See Tables 6 to 10 for individual types of livestock.

There are similar data problems with the hay and roughage estimates. The supply of roughage includes hay and silage. If silage is converted to hay equivalent on a dry weight basis, the silage supply is multiplied by one-third.<sup>1/</sup> This provides an estimated 1974-76 silage supply of 1.3 million tons (one-third of the 3.4 mil. tons shown in Table 4) in addition to the 7.6 million tons of hay. The total supply of 8.9 million tons compares with estimated use of 7.9 million tons. The California horse population was about 835,000 in 1972.<sup>2/</sup> So it is reasonable to assume that horses use the 1 million ton difference, since horses on the average consume over a ton of hay annually.

Pasture use is estimated at 26.5 million animal unit months for 1974-76 which is somewhat lower than in 1961-65 due to reduced sheep and lamb numbers and more intensive dairy animal production practices. Supply and utilization data for pasture and rangeland noted in the previous section, must be considered as only rough approximations, subject to unknown ranges of error.

#### Feed Use by Type of Livestock

The following discussion of estimates of feed use by type of livestock and poultry will highlight briefly important changes between the two periods. Feed use by livestock type is based on typical rations given in Appendix B and yearly data on livestock and poultry numbers given in Appendix C.

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<sup>1/</sup> An alternative way of calculating feed requirements and supplies is on a net energy or total digestible nutrient basis. Feed requirements for a single year, 1976, are so calculated in the appendix.

<sup>2/</sup> Unpublished data provided by the American Horse Council, Inc., Washington, D.C.

### Dairy cattle

Milk production in California has increased steadily over the past decade, with the average number of milk cows about equal in 1961-65 and 1974-76. Milk production per cow, however, increased sharply, from 10,100 pounds in 1961 to 14,462 pounds in 1977. Concentrate and hay feeding has increased accordingly (see Table 6). The amount of pasture used, measured in animal unit months, has decreased over time associated with more intensive methods of milk production and raising replacements.

### Beef cattle

Feedlot operations utilize about 34 percent of total feed grains and by-products fed in California as well as substantial quantities of hay (Table 7). Feedlot marketings increased sharply during the early 1960's, and remained at about two million head from 1967 to 1974 (see Figure 2). Feedlot marketings dropped sharply in 1975, both in California and in all states, associated with unfavorable economic conditions in the livestock industry.

Feeders and stockers shipped into California are the main source of animals for feedlots. Typically, about 1.8 million head are shipped to California annually (see Figure 2). About 0.4 million head are shipped out of California, mainly from Northern California. The regional nature of livestock production will be discussed in a subsequent report and will not be duplicated here, but attention should be given to Appendix A which traces the regional California throughput of beef cattle for a single year, 1976.

Table 6

California Dairy Animal Numbers, Estimated Feed Per Head and Total Fed Annually, 1961-1965 and 1974-1976

| Year      | Type of animal        | Number per 100 cows | Total number fed per year <sup>a/</sup> | Estimated quantity fed per head <sup>b/</sup> |                    |                    |        |         | Estimated total quantity fed |                    |                    |          |         |
|-----------|-----------------------|---------------------|---|---|--------------------|--------------------|--------|---------|------------------------------|--------------------|--------------------|----------|---------|
|           |                       |                     |   | Feed grains                                   | Other concentrates | Total concentrates | Hay    | Pasture | Feed grains                  | Other concentrates | Total concentrates | Hay      | Pasture |
|           |                       |                     | 1000 head                               | pounds  |                    |                    | AUM    |         | 1000 tons                    |                    |                    | 1000 AUM |         |
| 1961-1965 | Milk cows, ave/year   | 100.0               | 798                                     | 1,370   | 1,897              | 3,267              | 10,795 | 4.5     | 546                          | 756                | 1,322              | 4,307    | 3,591   |
|           | average               | 32.6                | 260                                     | 275   | 444                | 719                | 3,650  | 5.6     | 36                           | 58                 | 94                 | 117      | 1,456   |
|           | Replacement heifers   | 32.6                | 260                                     | 275 <sup>c/</sup>                             | 444                | 719                | 900    | 5.6     | 36                           | 58                 | 94                 | 474      | 1,456   |
|           | Heifer calves         | 2.9                 | 23                                      | -   | -                  | -                  | 900    | 5.6     | -                            | -                  | -                  | 10       | 129     |
|           | Steer and bull calves | 1.6                 | 13                                      | -   | -                  | -                  | 9,000  | 5.6     | -                            | -                  | -                  | 59       | 73      |
|           | Bulls                 | 1.6                 | 13                                      | -   | -                  | -                  | 9,000  | 5.6     | -                            | -                  | -                  | 59       | 73      |
|           | Total                 | -                   | -                                       | -   | -                  | -                  | -      | -       | 618                          | 872                | 1,490              | 4,967    | 6,705   |
| 1974-1976 | Milk cows, ave/year   | 100.0               | 803                                     | 1,912   | 3,198              | 5,110              | 12,200 | 1.1     | 768                          | 1,284              | 2,052              | 4,898    | 883     |
|           | average               | 39.5                | 296                                     | 392   | 734                | 1,126              | 5,329  | 5.6     | 58                           | 108                | 166                | 789      | 1,658   |
|           | Replacement heifers   | 39.5                | 296                                     | 392   | 734                | 1,126              | 900    | 5.6     | 58                           | 108                | 166                | 133      | 1,658   |
|           | Heifer calves         | 2.6                 | 21                                      | -   | -                  | -                  | 900    | 5.6     | -                            | -                  | -                  | 9        | 146     |
|           | Steer and bull calves | 1.4                 | 11                                      | -   | -                  | -                  | 9,000  | 5.6     | -                            | -                  | -                  | 50       | 62      |
|           | Bulls                 | 1.4                 | 11                                      | -   | -                  | -                  | 9,000  | 5.6     | -                            | -                  | -                  | 50       | 62      |
|           | Total                 | -                   | -                                       | -   | -                  | -                  | -      | -       | 884                          | 1,502              | 2,386              | 5,879    | 4,407   |

a/ Data on milk cows and replacement heifers (1970 to date) are given in Appendix Table B-1. Heifer calves, steer and bull calves, and dairy bulls for 1961-1965 are as reported in earlier issues. These data are not reported subsequent to 1970 and are estimated by the same "numbers per 100 cows" as in 1961-1965.

b/ Estimate for milk cows based on estimated feed fed per hundredweight of milk. Summary information on production and consumption are noted below:

| Year              | Production per cow <sup>d/</sup> | Feed per cwt. milk <sup>e/</sup> |        |                    | Total milk production <sup>d/</sup> |
|-------------------|----------------------------------|----------------------------------|--------|--------------------|-------------------------------------|
|                   |                                  | Grain                            | Other  | Total concentrates |                                     |
|                   |                                  | pounds                           | pounds |                    | mil. lbs.                           |
| 1961-1965 average | 10,492                           | 13.05                            | 18.55  | 31.6               | 8,368                               |
| 1974-1976 average | 13,714                           | 16.5                             | 20.2   | 36.7               | 11,011                              |

c/ Dashes indicate data not relevant.

d/ See Appendix Table C-1.

e/ See Appendix Table B-1 for rations for milk cows.

Table 7

California Beef Cattle Numbers, Estimated Feed Per Head and Total Quantities Fed Annually, 1961-1965 and 1974-1976

| Year                 | Type of animal         | Number<br>per 100<br>cows | Total<br>number<br>fed per<br>year | Estimated quantity fed per head |                       |                       |       |         | Estimated total quantity fed |                       |                       |           |         |
|----------------------|------------------------|---------------------------|------------------------------------|---------------------------------|-----------------------|-----------------------|-------|---------|------------------------------|-----------------------|-----------------------|-----------|---------|
|                      |                        |                           |                                    | Feed<br>grains                  | Other<br>concentrates | Total<br>concentrates | Hay   | Pasture | Feed<br>grains               | Other<br>concentrates | Total<br>concentrates | Hay       | Pasture |
|                      |                        |                           | 1000 head                          | pounds                          |                       |                       | AUM   |         | 1000 tons                    |                       |                       | 1000 AUMs |         |
| 1961-1965<br>average | Feedlot marketings     | <u>a/</u>                 | 1,957                              | 1,730.0                         | 820                   | 2,550.0               | 480   | -       | 1,690                        | 800                   | 2,490                 | 470       | -       |
|                      | Cows that have calved  | 100.0                     | 889                                | 22.5                            | 90                    | 112.5                 | 2,000 | 11.7    | 10                           | 40                    | 50                    | 889       | 10,400  |
|                      | Heifer replacements    | 34.6                      | 308                                | -                               | -                     | -                     | 1,400 | 5.6     | -                            | -                     | -                     | 216       | 1,700   |
|                      | Lightweight calves fed | -                         | 200                                | 600.0                           | 225                   | 825.0                 | 1,425 | -       | 60                           | 22                    | 82                    | 142       | -       |
|                      | Calves raised          | 88.0                      | 785                                | -                               | -                     | -                     | -     | 5.6     | -                            | -                     | -                     | -         | 4,400   |
|                      | Bulls                  | 7.8                       | 69                                 | -                               | -                     | -                     | 1,400 | 5.6     | -                            | -                     | -                     | 48        | 400     |
|                      | Total                  | -                         | -                                  | -                               | -                     | -                     | -     | -       | -                            | 1,760                 | 862                   | 2,622     | 1,765   |
| 1974-1976<br>average | Feedlot marketings     | -                         | 1,612                              | 2,240.0                         | 960                   | 3,200.0               | 600   | -       | 1,805                        | 775                   | 2,580                 | 445       | -       |
|                      | Cows that have calved  | 100.0                     | 1,054                              | 25.0                            | 90                    | 115.0                 | 2,000 | 11.7    | 13                           | 47                    | 60                    | 1,054     | 12,330  |
|                      | Heifer replacements    | 23.0                      | 242                                | -                               | -                     | -                     | 1,400 | 5.6     | -                            | -                     | -                     | 169       | 1,355   |
|                      | Lightweight calves fed | -                         | 1,000                              | 430.0                           | 230                   | 660.0                 | 540   | -       | 215                          | 115                   | 330                   | 270       | -       |
|                      | Calves raised          | 90.0                      | 950                                | -                               | -                     | -                     | -     | 5.6     | -                            | -                     | -                     | -         | 5,320   |
|                      | Bulls                  | 7.8                       | 82                                 | -                               | -                     | -                     | 1,400 | 5.6     | -                            | -                     | -                     | 57        | 460     |
|                      | Total                  | -                         | -                                  | -                               | -                     | -                     | -     | -       | -                            | 2,033                 | 937                   | 2,970     | 1,995   |

a/ Dashes indicate data not relevant.

Sources: Numbers fed: Appendix Table C-2. Rations: Appendix Tables B-2 and B-3.

The beef cow herd in California has shown cyclical inventory movements associated with variations in profitability and also in adjustments to range conditions of the recent drought years. The importance of pasture to this segment of the livestock industry is reflected in Table 5 where it is estimated that about three-fourths of all pasture was for beef animals in 1974-76. Use of rangeland for grazing is another important feed source.

#### Sheep and lambs

Sheep production in California (and the U.S.) has continued to decline over the past two decades. There were 1.4 million head of ewes one year old and older on January 1, 1961 but only 0.8 million head in 1978. On the demand side, consumer preferences appear to have changed in favor of competing meats. On the supply side, strong competition for available rangeland from beef cattle, as well as from nonagricultural uses, has been a factor in reducing numbers (Reed [1974]). Labor and predator problems also have plagued California's sheep industry in recent years. Most of the lambs from California flocks and lambs shipped into the state are fed on pasture, but some grain and other supplements are fed. Estimated animal feed use in 1961-65 and 1974-76 is given in Table 8.

#### Hogs

Hog production has continued to decline in California. Pigs saved in 1977 were 195,000 as compared with 482,000 in 1961. Most of our pork supply for consumption in the state is shipped in from the Midwest, as noted previously. One important change over the period of analysis is the increase in dressed weight per head, associated with the leaner-type hog produced in the country (see Table 9).

Table 8

California Sheep and Lamb Numbers, Estimated Feed Per Head and Total Quantities Fed Annually, 1961-1965 and 1974-1976

| Year                 | Type of animal                      | Number per 100 ewes | Total number per year | Estimated quantity fed per head |                    |                    |      |                       | Estimated total quantity fed |                    |                    |           |                       |
|----------------------|-------------------------------------|---------------------|-----------------------|---------------------------------|--------------------|--------------------|------|-----------------------|------------------------------|--------------------|--------------------|-----------|-----------------------|
|                      |                                     |                     |                       | Feed grains                     | Other concentrates | Total concentrates | Hay  | Pasture <sup>a/</sup> | Feed grains                  | Other concentrates | Total concentrates | Hay       | Pasture <sup>a/</sup> |
|                      |                                     | 1000 head           |                       | pounds                          |                    |                    | AUMs |                       | 1000 tons                    |                    |                    | 1000 AUMs |                       |
| 1961-1965<br>average | Ewes 1 year and over                | 100.0               | 1,293                 | 10 <sup>b/</sup>                | - <sup>c/</sup>    | 10.0               | 16   | 2.35                  | 6.5                          | -                  | 6.5                | 10.3      | 3,039                 |
|                      | Feedlot lambs                       | 2.3                 | 30                    | 42                              | 36                 | 78.0               | 240  | -                     | 0.7                          | 0.5                | 1.2                | 3.6       | -                     |
|                      | Lambs and yearlings on pasture      | 87.2                | 1,127                 | -                               | -                  | -                  | -    | 1.00                  | -                            | -                  | -                  | -         | 1,127                 |
|                      | Ewe lamb replacements <sup>d/</sup> | 20.0                | 259                   | -                               | -                  | -                  | 16   | 2.30                  | -                            | -                  | -                  | 2.1       | 596                   |
|                      | Rams and replacements               | 3.8                 | 50                    | -                               | -                  | -                  | 16   | 2.30                  | -                            | -                  | -                  | 0.4       | 115                   |
|                      | Total                               | -                   | -                     | -                               | -                  | -                  | -    | -                     | -                            | 7.2                | 0.5                | 7.7       | 16.4                  |
| 1974-1976<br>average | Ewes 1 year and over                | 100.0               | 866                   | 10                              | -                  | 10.0               | -    | 2.35                  | 4.3                          | -                  | 4.3                | 6.9       | 2,035                 |
|                      | Feedlot lambs                       | 2.5                 | 19                    | -                               | 36                 | 78.0               | 240  | -                     | 0.4                          | 0.3                | 0.7                | 2.3       | -                     |
|                      | Lambs and yearlings on pasture      | 88.1                | 763                   | -                               | -                  | -                  | -    | 1.00                  | -                            | -                  | -                  | -         | 305                   |
|                      | Ewe lamb replacements <sup>d/</sup> | 20.0                | 173                   | -                               | -                  | -                  | 16   | 2.30                  | -                            | -                  | -                  | 1.4       | 208                   |
|                      | Rams and replacements               | 3.6                 | 29                    | -                               | -                  | -                  | 16   | 2.30                  | -                            | -                  | -                  | .2        | 35                    |
|                      | Total                               | -                   | -                     | -                               | -                  | -                  | -    | -                     | -                            | 4.7                | 0.3                | 5.0       | 10.8                  |

<sup>a/</sup> Excludes stubble and aftermath. Based on estimates of A. D. Reed.

<sup>b/</sup> Allowance for concentrate supplement for pregnant ewes.

<sup>c/</sup> Dashes indicate data not relevant.

<sup>d/</sup> Assumes 20 percent replacement rate for ewes 1 year old and older.

Sources: Numbers: See Appendix Table C-4. Rations: See Appendix Table B-4.

Table 9

California Hog Numbers, Estimated Concentrates Fed Per Head and Total Concentrates Fed Annually, 1961-1965 and 1974-1976<sup>a/</sup>

| Year              | Type of animal | Number per 100 pigs saved | Total number per year | Estimated concentrates fed per head |                    |       | Estimated total concentrates fed |                    |       |
|-------------------|----------------|---------------------------|-----------------------|-------------------------------------|--------------------|-------|----------------------------------|--------------------|-------|
|                   |                |                           |                       | Feed grains                         | Other concentrates | Total | Feed grains                      | Other concentrates | Total |
|                   |                |                           | 1000 head             | pounds                              |                    |       | 1000 tons                        |                    |       |
| 1961-1965 average | Pigs saved     | 100                       | 308                   | <u>b/</u>                           | -                  | -     | -                                | -                  | -     |
|                   | Grain-fed pigs | 72                        | 222                   | 985                                 | 163                | 1,148 | 109.3                            | 18.1               | 127.4 |
|                   | Total          | -                         | -                     | -                                   | -                  | -     | 109.3                            | 18.1               | 127.4 |
| 1974-1976 average | Pigs saved     | 100                       | 194                   | -                                   | -                  | -     | -                                | -                  | -     |
|                   | Grain-fed pigs | 80                        | 155                   | 1,087                               | 199                | 1,286 | 84.2                             | 15.5               | 99.7  |
|                   | Total          | -                         | -                     | -                                   | -                  | -     | 84.2                             | 15.5               | 99.7  |

<sup>a/</sup> Data on pigs saved are from the California Crop and Livestock Reporting Service, California Livestock Statistics (various issues), Sacramento (processed). Number of grain fed pigs is based on estimated proportion of pigs saved that are grain-fed. The basis of feed requirements is:

| Year              | Production from grain-fed hogs<br>(estimated dressed weight<br>excluding lard) |   |                      | Feed required per pound<br>of dressed weight <sup>d/</sup> |                    |                    |
|-------------------|--|---|----------------------|--|--------------------|--------------------|
|                   | Estimated number   | Average dressed weight/head <sup>c/</sup> | Estimated production | Feed grains  | Other concentrates | Total concentrates |
|                   | 1000 head  | pounds                                    | mil. lbs.            | pounds   |                    |                    |
| 1961-1965 average | 222  | 143                                       | 31.7                 | 6.9  | 1.1                | 8.0                |
| 1974-1976 average | 206  | 166                                       | 34.2                 | 6.6  | 1.2                | 7.8                |

<sup>b/</sup> Dashes indicate data are not relevant.

<sup>c/</sup> U.S. average as reported in U.S. Economics, Statistics, and Cooperatives Service, Livestock and Meat Statistics, Statistical Bulletin No. 522 (various issues), Washington (processed). The increase in average dressed weight is due to the reduction in lard content since average liveweights have remained relatively constant.

<sup>d/</sup> See Appendix Table B-5.



Feed use by hogs in California is minor when compared with that of other types of livestock, but these animals can utilize by-products that might otherwise be wasted. Recall that our list of available by-products underestimates the total supply. The rations specified here are based on estimated typical statewide rations given in Appendix B.

### Poultry

The California poultry industry consists of three important producing sectors: eggs, turkeys, and broilers and fryers. Poultry used about three million tons of feed concentrates annually in recent years.

Egg production--Total egg production increased from 6.1 billion in 1961 to 9.0 billion in 1976, associated with increased number of layers, but egg production per bird has remained relatively constant. Layers are the major users of feed concentrates within the poultry aggregate (see Table 10). California currently produces more eggs than it consumes, as noted previously.

Broiler production--Broiler and fryer production in California (and the U.S.) has increased rapidly during the past two decades (see Figure 2). There have been important gains in feed conversion efficiency that have served to dampen price increases and thus have made broiler meats attractive to consumers on a price relative basis. In 1974-76 annual feed use for broiler production was estimated at 451,000 tons as compared with 270,500 tons for 1961-65 (see Table 10). California faces competition in broiler production, primarily from the Southeast, in supplying the market here.

Table 10

California Poultry Numbers, Estimated Concentrates Fed Per Head and Total Concentrates Fed Annually 1961-1965 and 1974-1976

| Year              | Type of poultry                | Total number per year | Estimated quantity fed per head <sup>a/</sup> |                    |                    | Estimated total quantity fed |                    |                    |         |         |
|-------------------|--------------------------------|-----------------------|---|--------------------|--------------------|------------------------------|--------------------|--------------------|---------|---------|
|                   |                                |                       | Feed grains                                   | Other concentrates | Total concentrates | Feed grains                  | Other concentrates | Total concentrates |         |         |
|                   |                                | 1000 birds            | pounds  |                    |                    | 1000 tons                    |                    |                    |         |         |
| 1961-1965 average | Layers, including replacements | 29,943                | 79.0  | 37.0               | 116.0              | 1,182.8                      | 553.9              | 1,736.7            |         |         |
|                   | Broilers produced              | 60,115                | 5.6   | 3.4                | 9.0                | 168.3                        | 102.2              | 270.5              |         |         |
|                   | Broiler breeding flock         | 427                   | 115.5   | 55.0               | 170.5              | 24.7                         | 11.7               | 36.4               |         |         |
|                   | Turkeys raised                 | 16,450                | 49.7  | 27.3               | 77.0               | 408.8                        | 224.5              | 633.3              |         |         |
|                   | Turkey breeding flock          | 961                   | 115.2   | 64.8               | 180.0              | 55.4                         | 31.1               | 86.5               |         |         |
|                   | Total                          | - <sup>b/</sup>       | -   | -                  | -                  | -                            | -                  | -                  | 1,840.0 | 923.4   |
| 1974-1976 average | Layers, including replacements | 37,242                | 79.0  | 37.0               | 116.0              | 1,471.0                      | 689.0              | 2,160.0            |         |         |
|                   | Broilers produced              | 97,051                | 6.0   | 3.3                | 9.3                | 291.1                        | 160.1              | 451.2              |         |         |
|                   | Broiler breeding flock         | 682                   | 113.3   | 58.3               | 171.6              | 38.6                         | 19.9               | 58.5               |         |         |
|                   | Turkeys raised                 | 17,055                | 35.1  | 21.5               | 56.6               | 299.3                        | 183.3              | 482.6              |         |         |
|                   | Turkey breeding flock          | 770                   | 114.0   | 56.0               | 170.0              | 43.9                         | 21.6               | 65.5               |         |         |
|                   | Total                          | -                     | -   | -                  | -                  | -                            | -                  | -                  | 2,143.9 | 1,073.9 |

a/ Data given below were used in estimating quantities fed per head:

b/ Dashes indicate data not relevant.

| Year      | Eggs                |       |                | Broilers        |                                  |                               | Broiler breeding flock |                                   |        | Turkeys raised      |                 |                                  | Turkey breeding flocks        |               |                    |
|-----------|---------------------|-------|----------------|-----------------|----------------------------------|-------------------------------|------------------------|-----------------------------------|--------|---------------------|-----------------|----------------------------------|-------------------------------|---------------|--------------------|
|           | Production per bird |       | Feed per dozen | Weight per bird |                                  | Feed per pound dressed weight | Broiler chicks hatched | Egg production (85 percent hatch) |        | Feed per dozen eggs | Weight per bird |                                  | Feed per pound dressed weight | Eggs per bird | Added feed per egg |
|           | Number              | Dozen |                | Live            | Ready to cook (72 percent yield) |                               |                        | Number                            | dozen  |                     | Live            | Ready-to-cook (80 percent yield) |                               |               |                    |
|           | number              |       | pounds         | pounds          |                                  |                               | mil. lbs.              |                                   | pounds | pounds              |                 |                                  | number                        | pounds        |                    |
| 1961-1965 | 225                 | 18.75 | 6.2            | 3.7             | 2.66                             | 3.38                          | 65                     | 76                                | 6.33   | 11.5                | 19.3            | 15.4                             | 5.0                           | 72            | 2.5                |
| 1974-1976 | 225                 | 18.75 | 6.2            | 4.3             | 3.10                             | 3.00                          | 104                    | 122                               | 10.17  | 11.5                | 18.6            | 14.9                             | 3.8                           | 85            | 2.0                |

Sources: Numbers: Appendix Tables C-8 and C-9. Rations: Appendix Tables B-6 and B-7.

Turkey production--Although California is an important producer of turkey meat in the U.S., its market share has decreased from 18 percent in 1961-65 to about 13 percent in 1974-76 while U.S. consumption per capita has shown a steady increase over the past two decades (Figure 1).

Numbers of turkeys raised in California have shown sharp fluctuations over the past two decades (Figure 2). There have been important gains in feed conversion efficiency in recent years, which has allowed turkey to compete well with other meats (Table 10). In California the number of turkeys raised averaged 17.1 million in 1974-76 as compared with 16.4 million in 1961-65; however, due to increased feeding efficiency, total annual tonnage of feed used decreased from an estimated 633,300 tons (1961-65 average) to 482,600 tons annually in 1974-76. Additional feed is used by the turkey breeding flock.

#### ESTIMATED LAND AND WATER USED TO PRODUCE FEED

Here, we give estimates of land and water used for livestock feed in California in 1975. Land includes an estimate of the harvested acreage of grain used for feed, hay acreage, irrigated pasture, and nonirrigated range land. No allowance is made for land used to produce by-products (such as cottonseed meal) since land is more appropriately allocated to the primary product (cotton lint). Also, water used in livestock production and processing is not included.

#### Harvested Acreage

In 1975, California harvested acreage was 9,454,000 acres, including field crops (6,616,000), vegetables (909,000), and tree fruits, nuts and

grapes (bearing and nonbearing acreage of 1,929,000). About 47 percent of the harvested field crop acreage is for feed grains, wheat and hay (see Table 11).

Not all of the grain production is used for livestock feed since other uses, such as for food and industry, are important, particularly for wheat. Since shipments into the state are important, any allocation of local and imported grain to a particular utilization is arbitrary. For our purposes, we calculated the percentage that quantities fed in 1974-1976 were of California production plus imports and inshipments (see Table 11). Applying these percentages to 1975 harvested grain acreage of 2,801,000 gives an estimated acreage for livestock feed of 1,665,000. Hay acreage adds 1,650,000 acres. Thus, 3,315,000 acres were devoted to the production of livestock feed, or 50 percent of the total field crop acreage.

Estimates of the water applied on this livestock feed acreage are 2,671,000 acre-feet for grain plus 5,732,000 acre-feet for hay. As noted in Table 11, these estimates are based on the percentage of harvested acreage of each crop that is irrigated, as given in the 1974 Census of Agriculture, and unpublished estimates of applied water per acre irrigated. (Highstreet, et al, 1979).

#### Irrigated Pasture

About 1.2 million acres are used for livestock as irrigated pasture. Assuming 4.3 acre-feet of water per irrigated acre gives an estimated 5.2 million acre-feet for 1975. Thus, the total water used for livestock feed (grain, hay, and irrigated pasture) is 13.5 million acre-feet which is 42 percent of the 32 million acre-feet applied in 1975.

Table 11

Land and Water: Estimated Use for Livestock Feed Production, California, 1975

| Item                        | 1975                  | 1974                    | Derived                             | Applied                        | Derived                              | Estimated  | Derived  | Estimated land used   |                       |
|-----------------------------|-----------------------|-------------------------|-------------------------------------|--------------------------------|--------------------------------------|--|--|-----------------------|-----------------------|
|                             | harvested<br>acreaage | percentage<br>irrigated | irrigated<br>acreaage <sup>a/</sup> | water per<br>acre<br>irrigated | total water<br>applied <sup>b/</sup> | percentage<br>for<br>livestock<br>feed <sup>c/</sup> | water use<br>for livestock<br>feed <sup>d/</sup> | Harvested<br>acreaage | Irrigated<br>acreaage |
|                             | 1000 acres            | percent                 | 1000 acres                          | acre-feet                      | 1000 acre-feet                       | percent  | 1000 acre-feet                                   | 1000 acres            |                       |
| <u>Grain</u>                |                       |                         |                                     |                                |                                      |  |  |                       |                       |
| Barley                      | 1,060                 | 52                      | 551                                 | 1.7                            | 937                                  | 88   | 825  | 933                   | 485                   |
| Corn, including<br>silage   | 420                   | 98                      | 412                                 | 3.4                            | 1,401                                | 88   | 1,233  | 370                   | 363                   |
| Sorghum for grain           | 207                   | 97                      | 201                                 | 2.5                            | 502                                  | 92   | 462  | 190                   | 184                   |
| Oats                        | 113                   | 32                      | 36                                  | 1.7 <sup>g/</sup>              | 61                                   | 81   | 49   | 92                    | 29                    |
| Wheat                       | 1,001                 | 53                      | 531                                 | 2.4                            | 1,274                                | 8  | 102  | 80                    | 42                    |
| Total                       | 2,801                 | <u>f/</u>               | 1,731                               | -                              | 4,175                                | -  | 2,671  | 1,665                 | 1,103                 |
| <u>Hay</u>                  |                       |                         |                                     |                                |                                      |  |  |                       |                       |
| Alfalfa                     | 1,120                 | 95                      | 1,064                               | 4.8                            | 5,107                                | 100  | 5,107  | 1,120                 | 1,064                 |
| Other                       | 530                   | 50                      | 265                                 | 2.0                            | 530                                  | 100  | 530  | 530                   | 265                   |
| Total                       | 1,650                 | 80                      | 1,329                               | -                              | 5,637                                | -  | 5,637  | 1,650                 | 1,329                 |
| <u>Irrigated pasture</u>    | 1,200                 | 100                     | 1,200                               | 4.3                            | 5,160                                | 100  | 5,160  | 1,200                 | 1,200                 |
| <u>Total</u>                | 5,651                 | -                       | 4,260                               | -                              | 14,972                               | -  | 13,468   | 4,515                 | 3,632                 |
| <u>Total irrigated land</u> | -                     | -                       | 8,780                               | -                              | 31,690                               | -  | -  | -                     | -                     |
| <u>Range land</u>           | -                     | -                       | -                                   | -                              | -                                    | -  | -  | 35,968                | -                     |

a/ Calculated by multiplying percentage irrigated by harvested acreage.

b/ Calculated by multiplying derived irrigated acreage by applied water per acre irrigated.

c/ Calculated from Table 2 as the 1974-1976 average quantity fed to livestock as a percentage of the sum of California production plus feed shipped into the state.

d/ Calculated by multiplying derived total water applied by the estimated percentage for livestock feed.

e/ Calculated by multiplying acreage data by the estimated percentage for livestock feed.

f/ Dashes indicate data not relevant.

g/ Source is 1974 Census of Agriculture.

Sources: Harvested acreage of crops: California Crop and Livestock Reporting Service, Annual Field Crop Summary. Irrigated pasture: Rough estimate by authors. Percentage irrigated: U.S. Bureau of the Census, 1974 Census of Agriculture, Vol. 1, Part 5, p. I-23. Applied water per acre irrigated: Unpublished report by Highstreet, et al., 1979. Total irrigated acreage and total water applied: California Department of Water Resources, The California Water Plan, Outlook in 1974, Bulletin No. 160-74, November 1974. Range land: A. D. Reed, The Contribution of Range to the Economy of California, University of California Extension Report MA-82, 6174, Davis.

Range Land

An estimate of range land used for grazing by beef breeding herds, stocker cattle, sheep, plus some horses, goats, and dairy stock is provided by Reed [1974] and is summarized as acreage and animal unit months (AUM) as follows:

| Ownership                 | Acres         | AUM           |
|---------------------------|---------------|---------------|
|                           | Thousands     |               |
| Private ownership         | 23,211        | 13,100        |
| U.S. Forest               | 5,004         | 408           |
| Bureau of Land Management | <u>7,753</u>  | <u>445</u>    |
| TOTAL                     | <u>35,968</u> | <u>13,953</u> |

The estimate of total pasture used annually in 1974-1976 is 26.5 million animal units months. If range land contributes 14.0 million AUM, then irrigated pasture would contribute 12.5 million AUM. The AUM per acre then is .39 for range land and about 10.4 for irrigated pasture. Governmental policy on the use of grazing lands may influence the quantity and quality of this source of feed in the future.

Summary

Land and water used in 1975 for livestock feed and forage production is summarized briefly as follows:

| Item              | Land                   |                            | Water applied<br>million acre-feet |
|-------------------|------------------------|----------------------------|------------------------------------|
|                   | Total<br>million acres | Irrigated<br>million acres |                                    |
| Crop land         |                        |                            |                                    |
| Grain             | 1.7                    | 1.1                        | 2.7                                |
| Hay               | 1.6                    | 1.3                        | 5.6                                |
| Irrigated pasture | <u>1.2</u>             | <u>1.2</u>                 | <u>5.2</u>                         |
| TOTAL             | <u>4.5</u>             | <u>3.6</u>                 | <u>13.5</u>                        |
| Range land        | 36.0                   | -0-                        | -0-                                |

Use of range land for livestock grazing provides an economic return not otherwise available, with an estimated value of \$204 million [Reed, 1974]. The use of by-product feeds and the grazing of livestock on fields after harvest provide further economic use of resources that otherwise would be

The economics of water use for livestock feed production and for irrigated pasture is a complicated issue in which consideration must be given to the use of resources noted above in addition to the role of inshipments of grain and/or livestock products from other areas.

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## APPENDIX A

1976 CALIFORNIA LIVESTOCK AND POULTRY NUMBERS  
AND ESTIMATED FEED REQUIREMENTS<sup>1/</sup>

This section analyzes the supply and disposition of livestock and poultry for a particular year, 1976, and provides a more detailed analysis of feed requirements by season than is possible using average data shown previously in this report. Animal numbers are presented first, followed by estimated feed requirements in terms of animal unit months (AUM) for grazing livestock and total digestible nutrients (TDN) for housed or otherwise confined stock.

Livestock and Poultry Numbers

Tables on various classes of livestock and poultry are generally self-explanatory and no detailed summary is given in the text. However, the reasons for certain estimating procedures will be given.

Cattle

The stock of cattle on January 1, 1976 was 5 million head. This was augmented by 1.6 million calves born plus shipments of cattle into California of 1.8 million (see Appendix Table A-1). This total supply of 8.4 million is balanced with disposition as marketings, death losses and ending inventory. In deriving information on supply and disposition of various classes, estimates are required of death losses from particular classes and of culls and sales of breeding animals and young stock since published data do not include a complete breakdown of all stock. Reported deaths are 65,000 head

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<sup>1/</sup> This section was contributed by A. C. Bywater. Thanks are extended to J. Dunbar, C. Pelisier, D. Bath, and R. Ernst.

Appendix Table A-1

Cattle: Supply and Disposition, California, 1976

| Item                          | Supply                              |                      | Item                             | Disposition                     |                      |
|-------------------------------|-------------------------------------|----------------------|----------------------------------|---------------------------------|----------------------|
|                               | Beginning inventory January 1, 1976 | Additions 1976       |                                  | Ending inventory January 1 1976 | Uses in 1977         |
|                               | 1,000 head                          |                      |                                  | 1,000 head                      |                      |
| <u>Cattle</u>                 |                                     |                      |                                  |                                 |                      |
| Cows                          | 1820                                |                      | Cows                             | 1800                            |                      |
| Bulls                         | 85                                  |                      | Bulls                            | 71                              |                      |
| Heifer replacements           | 560                                 | 41.0 <sup>a/</sup>   | Marketed                         |                                 | 2917.0 <sup>b/</sup> |
| Inshipments for breeding      |                                     |                      | Deaths                           |                                 | 31.4 <sup>b/</sup>   |
| <u>Young Stock</u>            |                                     |                      |                                  |                                 |                      |
| Calves (less than 500 lbs.)   | 1165                                |                      | Calves (less than 500 lbs)       | 1070                            |                      |
| Steers                        | 1180                                |                      | Steers                           | 1120                            |                      |
| Nonreplacement heifers        | 190                                 |                      | Nonreplacement heifers           | 164                             |                      |
| Calves born                   |                                     | 1610.0               | Heifers retained as replacements | 525                             |                      |
| Inshipments: feeder cattle    |                                     | 1323.0               | Deaths: calves                   |                                 | 170.0 <sup>b/</sup>  |
| slaughter cattle              |                                     | 406.0                | stockers and feeders             |                                 | 33.6 <sup>b/</sup>   |
|                               |                                     |                      | Farm slaughter                   |                                 | 68.0                 |
|                               |                                     |                      | Calves marketed                  |                                 | 410.0                |
| Total inventory/additions     | 5000                                | 3380.0               | Total inventory/disposition      | 4750                            | 3630.0               |
| Total                         |                                     | 8380.0               | Total                            |                                 | 8380.0               |
| <u>Marketings</u>             |                                     |                      |                                  |                                 |                      |
| Sources: Feedlot              |                                     | 1844.0               | Reported marketings: cattle      |                                 | 2917.0               |
| Inshipments; slaughter cattle |                                     | 406.0                | calves                           |                                 | 410.0                |
| Est. culls and sales; cattle  |                                     | 603.6 <sup>c/</sup>  |                                  |                                 |                      |
| young stock                   |                                     | 473.4 <sup>d/</sup>  |                                  |                                 |                      |
| Total                         |                                     | 3327.0 <sup>e/</sup> |                                  |                                 | 3327.0               |

a/ Reported inshipments of 1,770,000 head include 1,323,000 stockers and feeders, 406,000 slaughter cattle leaving 41,000 head assumed breeding animals.

b/ Reported cattle deaths of 65,000 are allocated proportionally between the breeding herd and all other cattle over 500 lbs; calf deaths of 170,000 are reported separately.

c/ See Appendix Table A-2.

d/ See Appendix Table A-3.

e/ Reported slaughter of 3,211,000 head (2,855,000 cattle; 356,000 calves) implies 116,000 head marketed but not slaughtered.

Source: California Crop and Livestock Reporting Service California Livestock Statistics, Sacramento, 1979.

for cattle and 170,000 head for calves. Cattle deaths are allocated to all classes of stock over 500 lbs. proportional to the total numbers in each class. This represents an average death rate of 1.25 percent. Calf losses are allocated between calf inventory and newborn animals assuming death losses from inventory equal the death rate of older stock (i.e., 1.25 percent) and that remaining deaths are of newborn--155,400 head or 9.65 percent. Allocation of losses between beef and dairy calves is proportional to the number in each class; although the cause of losses in the two industries are likely to be different, there is no indication that death rates differ significantly.

A summary of marketing sources is given in Appendix Table A-1. Feedlots accounted for 1.8 million cattle marketed in 1976, inshipments of cattle for slaughter equaled a further 0.4 million and the remainder are estimated culls and sales from the breeding herd and surplus young stock. Both the latter estimates and the published total marketing figures are balance items between supply and other disposition. Reported slaughter of approximately 2.86 million head of cattle and .36 million head of calves results in 116,000 head being marketed and not slaughtered in state. These animals are assumed to be shipped out of state although reported outshipments were 469,700 during 1976. This latter figure presumably includes animals which are shipped out without change in ownership.

Estimated culls and sales from the breeding herd are derived in Appendix Table A-2, with beef and dairy animals separated out to allow the calculation of feed requirements for each. The general procedure is one of balancing beginning and ending inventory data, adjusted for inshipments and death losses. The estimated total culls and sales of 603,600 will be used



subsequently in calculating feed requirements. The division of bulls between beef and dairy animals is made on the assumption that there are an average of five bulls (including immature bulls and bulls at specialist breeding or artificial insemination centers) for each of approximately 3,000 dairies in the state, for a total of 15,000 dairy bulls. The remainder of reported bull numbers are considered to be beef bulls.

Supply and disposition of young stock are shown in Appendix Table A-3 divided into calves and stocker cattle and feedlot cattle. Calf births are allocated between beef and dairy animals based on reported cow inventories on January 1, 1976. Division of the calf inventory between beef and dairy calves is based on the assumption that beef calves on hand are those born in Fall, 1975 in Central and Southern California and that the remainder are dairy calves. The number of Fall-born calves is estimated from the cow inventory for relevant counties. Calf deaths are allocated as previously noted. Total supply of calves and stockers including January 1 inventory and 1976 births amount to just under 3.2 million head. After allowance for death losses and ending inventories of calves, retained heifers, replacements and stocker cattle, approximately 0.94 million head are available for feedlot placement or sale.

Feedlot cattle are of particular importance in California. For 1976, the beginning inventory was 960,000, with 1,985,000 reported placed on feed. Of those placed on feed, 289,000 are reported to include movements from feedlots to pasture and shipments to other feedlots as well as death losses. The latter is estimated at 28,500 which almost certainly is an underestimate for two reasons. First it is based on a proportional distribution of deaths among all classes of stock over 500 lbs. A higher death rate might

Appendix Table A-3

## Young Stock: Supply and Disposition, California, 1976

| Beginning inventory and additions  |                        | Ending inventory, death losses, marketings and estimated surplus |                        |
|------------------------------------|------------------------|--|------------------------|
|                                    | 1,000 head             |  | 1,000 head             |
| <u>Calves and Stocker Cattle</u>   |                        |  |                        |
| Calf inventory, January 1, 1976    | (1165.0) <sup>a/</sup> | Calf inventory, January 1, 1977                                  | (1070.0) <sup>a/</sup> |
| Beef                               | 711.3                  | Beef   | 687.1                  |
| Dairy                              | 453.7                  | Dairy  | 382.9                  |
| Calves born in 1976                | (1610.0) <sup>a/</sup> | Calf deaths: <sup>b/</sup>                                       |                        |
| Beef                               | 893.5                  | From inventory: Beef   | 8.9                    |
| Dairy                              | 716.5                  | Dairy  | 5.7                    |
| Stocker inventory, January 1, 1976 | 410.0 <sup>c/</sup>    | From 1976 crop: Beef   | 86.2                   |
|                                    |                        | Dairy  | 69.2                   |
|                                    |                        | Heifer replacements, January 1, 1977                             |                        |
|                                    |                        | Beef   | 210.0                  |
|                                    |                        | Dairy  | 315.0                  |
|                                    |                        | Stocker inventory, January 1, 1977                               | 472.0 <sup>d/</sup>    |
|                                    |                        | Est. stocker deaths  | 5.1 <sup>d/</sup>      |
|                                    |                        | Calves and stockers available                                    | 942.9 <sup>e/</sup>    |
| Total                              | 3185.0                 | Total  | 3185.0                 |
| <u>Feedlot Cattle</u>              |                        |  |                        |
| Inventory, January 1, 1976         | 960.0                  | Inventory, January 1, 1977                                       | 812.0                  |
| Placed on feed                     | 1985.0                 | Marketed   | 1844.0                 |
|                                    |                        | Est. deaths  | 28.5 <sup>d/</sup>     |
|                                    |                        | Other disappearance  | 260.5 <sup>f/</sup>    |
| Total                              | 2945.0                 | Total  | 2945.0                 |
| <u>Balance, All Young Stock</u>    |                        |  |                        |
| Inshipments, feeder cattle         | 1323.0                 | Net placements on feed   | 1724.5 <sup>g/</sup>   |
| Calves and stockers available      | 942.9                  | Farm slaughter   | 68.0                   |
|                                    |                        | Est. surplus calves and stockers                                 | 473.4 <sup>e/</sup>    |
| Total                              | 2265.9                 | Total  | 2265.9                 |

a/ Inventory numbers and births allocated between beef and dairy based on inventories and location of cows as described in text and illustrated in Appendix Figures A-1 and A-2.

b/ Reported calf deaths of 170,000 allocated between inventory and 1976 crop assuming death loss from inventory is equal to death rate of breeding herd and other cattle over 500 lbs. (1.25%) with remaining deaths allocated to newborn (equals 9.65%). Allocation between beef and dairy is proportional to numbers of animals.

c/ Stocker inventory calculated as steers plus other heifers minus animals on feed.

d/ See Appendix Table A-1 footnote b/.

e/ Balance between supply and disposition.

f/ Data reported in Cattle on Feed indicate disappearance from feedlots of 289,000 head including deaths, movement to pasture and to other feedlots for further feeding. This number deducts estimated death loss.

g/ Number placed on feed minus other disappearance.

Sources: California Livestock Statistics, 1977--see Appendix Table A-1; and Cattle on Feed, various monthly issues, 1977, California Crop and Livestock Reporting Service, Sacramento.



be expected in feedlots than in other situations even though losses in the Imperial Valley, which accounts for a large proportion of cattle on feed in the state, appear to be consistently lower than in other major cattle feeding areas. Second, the estimate is the sum of deaths allocated to the beginning feedlot inventory and inshipments of feeder cattle only; deaths of state born calves and stockers, some of which must enter feedlots, are accounted separately since there is no way to allocate these deaths to the periods before and after placement on feed. Recognizing this deficiency, net placements on feed are estimated as total placements minus disappearance other than deaths, or (1,985,000-260,500) 1,724,500 head.

The balance of all young stock including supplies of in-state calves and stockers, inshipments of feeder cattle, net feedlot placements and reported farm slaughter results in estimated surplus young stock of 473,400 head. Estimated feed requirements, described subsequently, are based on the distribution of stock derived here.

### Sheep

The 1976 beginning-year inventory of sheep and of lambs on feed of 1.1 million was augmented by the 1976 lamb crop (738,000) plus shipments into California of stockers and feeders (198,000) and those for immediate slaughter (645,000). Of these stockers and feeders, 37,000 are estimated requirements for the breeding flock with the remainder (161,000) considered as feeder lambs (see Appendix Table A-4). The disposition of sheep and lambs is a straightforward accounting of inventory levels and marketings. Note, however, that total marketings of 1,458,000 exceed reported slaughter (1,307,000) by 151,000 head which are assumed to be permanent outshipments (not reported by

Appendix Table A-4

## Sheep: Supply and Disposition, California, 1976

| Item                     | Supply                                 |                   | Item                       | Disposition                         |                    |
|--------------------------|--|-------------------|----------------------------|-------------------------------------|--------------------|
|                          | Beginning inventory<br>January 1, 1976 | Additions in 1976 |                            | Ending inventory<br>January 1, 1977 | Uses in 1976       |
|                          | 1,000 head                             |                   |                            | 1,000 head                          |                    |
| <u>Sheep</u>             |  |                   |                            |                                     |                    |
| Ewes                     | 811                                    |                   | Ewes                       | 770                                 |                    |
| Wethers and rams         | 29                                     |                   | Wethers and rams           | 27                                  |                    |
| Total                    | (840)                                  |                   | Deaths                     |                                     | 60                 |
| Replacements             |  |                   | Marketings                 |                                     | 128                |
| Ewes                     | 89                                     |                   |                            |                                     |                    |
| Rams                     | 19                                     |                   |                            |                                     |                    |
| Total                    | (108)                                  |                   |                            |                                     |                    |
| Shipped into California  |  | 37 <sup>a/</sup>  |                            |                                     |                    |
| <u>Young Stock</u>       |  |                   |                            |                                     |                    |
| Lambs on feed            | 182                                    |                   | Lambs on feed              | 213                                 |                    |
| Lambs docked             |  | 738               | Stock ewe lambs            | 82                                  |                    |
| Shipped into California  |  |                   | Stock wether and ram lambs | 21                                  |                    |
| as feeders               |  | 161 <sup>a/</sup> | Deaths                     |                                     | 67                 |
| for slaughter            |  | 645               | Farm slaughter             |                                     | 13                 |
|                          |  |                   | Marketings                 |                                     | 685                |
|                          |  |                   | Shipped in for slaughter   |                                     | 645                |
| Total                    | 1130                                   | 1581              |                            | 1113                                | 1598               |
| Total supply/disposition |  | 2711              |                            |                                     | 2711               |
| <u>Summary</u>           |  |                   |                            |                                     |                    |
| Beginning inventory      |  | 1130              | Ending inventory           |                                     | 1113               |
| Inshipments              |  | 843               | Deaths                     |                                     | 127                |
| Lambs docked             |  | 738               | Farm slaughter             |                                     | 13                 |
| Total                    |  | 2711              | Marketings                 |                                     | 1458 <sup>b/</sup> |
|                          |  |                   |                            |                                     | 2711               |

a/ Inshipments of sheep and lambs are reported as 198,000 head. An estimated 37,000 head are required to balance supply and disposition in the breeding herd and the remaining 161,000 are assumed to be feeder lambs.

b/ Reported slaughter of 1,307,000 and marketings of 1,458,000 leaves marketings not slaughtered of 151,000 which are assumed to be permanent outshipments of fat lambs for the Easter market.

Source: California Livestock Statistics, (see Appendix Table A-1).

CCLRS) of fat lambs for the spring market. The total number of feeder lambs placed on feed will be discussed in conjunction with the estimation of feed requirements.

#### Hogs and Pigs

Of the total 1976 slaughter of 1,550,000 hogs in California, 1,375,000 are shipped in for immediate slaughter. The California pig crop was 206,000 in 1976. The supply and disposition of hogs and pigs, shown in Appendix Table A-5, are reported data except for an allocation of reported deaths between the breeding herd and young stock, based on beginning inventory levels. Note also that breeding herd "culls and sales" and young stock "surplus state-born pigs" are estimated such that supply and disposition balance for the year. Also, there is a slight discrepancy between reported marketings and slaughter of 5,000 which is termed as "estimated marketings not slaughtered." Again, this is a minor difference attributable to reporting errors.

#### Poultry

The 1976 supply and disposition of layers, broilers and turkeys, are given in Appendix Table A-6. All data are as reported except death losses and beginning-year inventory of broiler chicks and young turkeys. The beginning inventory of broiler chicks is based on eggs hatched during the four weeks prior to December 1, or one-half of the eight weeks required for growth to slaughter weight. Similarly, turkey inventory numbers are based on eggs hatched during the 12 weeks prior to December 1, or one-half of the 24 weeks required for growth to slaughter weight.

#### Estimated Feed Requirements

Livestock and poultry feed requirements for 1976 are in general calculated as requirements per animal (or bird) times the number of animals.

Appendix Table A-5

## Hogs and Pigs: Supply and Disposition, California, 1976

| Item                                      | Supply                                  |                      | Item                                    | Disposition                             |                     |
|---|---|----------------------|---|---|---------------------|
|   | Beginning inventory<br>December 1, 1975 | Additions in<br>1976 |   | Beginning inventory<br>December 1, 1976 | Uses in<br>1976     |
|   | 1,000 head                              |                      |   | 1,000 head                              |                     |
| <u>Breeding herd and<br/>Young Stock</u>  |   |                      |   |   |                     |
| Breeding pigs                             | 26.0                                    |                      | Breeding pigs                           | 24.0                                    |                     |
| Market hogs                               | 112.0                                   |                      | Market hogs                             | 109.0                                   |                     |
| Inshipments                               |   | (1,393.0)            | Inshipments                             |   | 1,375.0             |
| for breeding                              |   | 18.0                 | for slaughter                           |   | 22.0 <sup>a/</sup>  |
| for slaughter                             |   | 1,375.0              | Deaths                                  |   | 22.0                |
| Pigs saved                                |   | 206.0                | Farm slaughter                          |   | 185.0               |
| Total                                     | 138.0                                   | 1,599.0              | Marketings                              | 133.0                                   | 1,604.0             |
| Total supply/disposition                  |   | 1,737.0              |   |   | 1,737.0             |
| <u>Breeding Herd</u>                      |   |                      |   |   |                     |
| Breeding pigs                             | 26.0                                    |                      | Breeding pigs                           | 24.0                                    |                     |
| Inshipment for breeding                   |   | 18.0                 | Estimated<br>deaths                     |   | 1.6 <sup>a/</sup>   |
| Total                                     | 26.0                                    | 18.0                 | culls and sales                         | 24.0                                    | 18.4 <sup>b/</sup>  |
| Total supply/disposition                  |   | 44.0                 |   |   | 20.0                |
| <u>Young Stock</u>                        |   |                      |   |   | 44.0                |
| Market hogs                               | 112.0                                   |                      | Market hogs                             | 109.0                                   |                     |
| Pigs saved                                |   | 206.0                | Farm slaughter                          |   | 22.0                |
| Total                                     | 112.0                                   | 206.0                | Estimated deaths                        |   | 20.4 <sup>a/</sup>  |
| Total supply/disposition                  |   | 318.0                | Estimated surplus<br>state-born pigs    | 109.0                                   | 166.6 <sup>b/</sup> |
|   |   |                      |   |   | 209.0               |
|   |   |                      |   |   | 318.0               |
| <u>Total Marketings and<br/>Slaughter</u> |   |                      |   |   |                     |
| Inshipments for slaughter                 |   | 1,375.0              | Reported slaughter                      |   | 1,555.0             |
| Marketings                                |   | (185.0)              | Estimated marketings<br>not slaughtered |   | 5.0                 |
| Estimated culls                           |   | 18.4                 |   |   |                     |
| Estimated surplus pigs                    |   | 166.6                |   |   |                     |
| Total                                     |   | 1,560.0              |   |   | 1,560.0             |

<sup>a/</sup> Reported deaths are allocated to breeding herd and young stock on the basis of beginning inventory numbers.

<sup>b/</sup> Calculated to balance supply and disposition.

Source: California Livestock Statistics (see Appendix Table A-1).

Appendix Table A-6

## Poultry: Supply and Disposition, California, 1976

| Item                         | Supply                                  |                      | Item                         | Disposition                          |                           |
|------------------------------|---|----------------------|------------------------------|--------------------------------------|---------------------------|
|                              | Beginning inventory<br>December 1, 1975 | Additions in<br>1976 |                              | Ending inventory<br>December 1, 1976 | Uses in<br>1976           |
| <u>Laying Flock</u>          |   |                      |                              |                                      |                           |
| Hens                         | 22,978                                  |                      | Hens                         | 21,969                               |                           |
| Pullets of laying age        | 14,714                                  |                      | Pullets                      | 14,953                               |                           |
| Other chickens               | 240                                     |                      | Other                        | 250                                  |                           |
| Pullets reaching laying age  |   | 21,962               | Mature birds sold            |                                      | 17,429                    |
| Total                        |   | <u>21,962</u>        | Assumed death loss           |                                      | <u>5,293<sup>a/</sup></u> |
| Total supply/disposition     |   | 59,894               |                              | <u>37,172</u>                        | 22,722                    |
| <u>Replacement Layers</u>    |   |                      |                              |                                      |                           |
| Pullets not of laying age    | 10,139                                  |                      | Pullets not of laying age    | 9,019                                |                           |
| Placements of pullets        |   | <u>24,631</u>        | Pullets raised               |                                      | 21,962                    |
| Total                        | 10,139                                  | 24,631               | Assumed death loss           |                                      | <u>3,789<sup>a/</sup></u> |
| Total supply/disposition     |   | 34,770               |                              | <u>9,019</u>                         | 25,751                    |
| <u>Broilers</u>              |   |                      |                              |                                      |                           |
| Eggs hatched                 |   |                      | Eggs hatched                 |                                      |                           |
| Nov.-Dec. 1975               | 17,043                                  |                      | Nov.-Dec. 1976               | 17,580                               |                           |
| 1976                         |   | 113,266              | Broilers produced            |                                      | 104,950                   |
| Total                        | 17,043                                  | <u>113,266</u>       | Assumed death loss           |                                      | <u>7,779<sup>a/</sup></u> |
| Total supply/disposition     |   | 130,309              |                              | <u>17,580</u>                        | 112,729                   |
| <u>Turkeys</u>               |   |                      |                              |                                      |                           |
| Eggs hatched, Aug.-Dec. 1975 | 3,357                                   |                      | Eggs hatched, Aug.-Dec. 1975 | 3,701                                |                           |
| 1976                         |   | 20,318               | Turkeys raised               |                                      | 17,514                    |
| Total                        | 3,357                                   | <u>20,318</u>        | Assumed death loss           |                                      | <u>2,460<sup>a/</sup></u> |
| Total supply/disposition     |   | 23,675               |                              | <u>3,701</u>                         | 19,974                    |
|                              |   |                      |                              |                                      | 23,675                    |

<sup>a/</sup> Death losses were estimated so as to balance supply and disposition; death rates implied for each class are laying flock 8.8 percent, replacement layers 10.89 percent, broilers 5.96 percent, and turkeys 10.39 percent.

Source: California Crop and Livestock Reporting Service, Production and Marketing Eggs, Chickens and Turkeys, California-1978, Sacramento.

Note that stocker cattle and replacement heifers may be grazed out of state for extended periods and thus total requirements may differ somewhat from available supply. Without more comprehensive data on such cattle shipments, it was not considered reasonable to adjust data for minor grazing done outside of California.

Two terms are used in estimating feed requirements; animal unit months and total digestible nutrients. Because of the enormous variation in the quantity and quality of available forage (annual rangelands, irrigated pasture, crop stubble and conserved forages), it was considered inappropriate to describe grazing requirements in terms more sophisticated than animal unit months (AUM). On the other hand, for more controlled feeding situations requirements are expressed in terms of total digestible nutrients (TDN). Feed requirements for swine and poultry, which are usually expressed in terms of digestible energy (DE) or metabolizable energy (ME), have been converted to TDN as follows:

$$DE = ME/0.96$$

$$TDN(1b) = 2.2 \times TD(kg) = \frac{DE(Mcals)}{4.409}$$

#### Beef Herd

There are important differences in calving and culling practices between northeastern parts of California and the remainder of the state. Although there is variation in all areas both as a matter of deliberate choice and because of variations in the distribution of calving on individual ranches, the majority of calves in the northeast are born in late Winter/early Spring whereas elsewhere the majority are born in Fall and early Winter. For purposes here, cows in five northern counties (enumerated in footnote (a) of

Appendix Table A-7) are assumed to calve in Spring (with a mean of February) and cows in other counties are assumed to calve in the Fall (with a mean of October). Culling of beef cows is assumed to occur six months prior to the specified calving month in calculating feed requirements. Deaths and breeding stock shipped into the state are assumed to occur uniformly throughout the year, with a mean date of July 1, implying six months of feeding per animal. The stock and flow of cattle are seen more clearly in Appendix Figure A-1.

Feed requirements for cows and heifers, including an allowance for the calf to three months of age, are specified as one AUM for each of 12 months, and for bulls, 1.25 AUM. Annual total AUM are shown in Appendix Table A-7 for animals fed 12 months, and for those fed a specified number of months as explained in footnotes to the table. For example, the beginning inventory of cows in the northern counties of 150,300 is divided into those fed all year (109,900), deaths which are assumed to be fed for six months (1,900) and culls which are assumed to be fed for eight months (38,500). A total of 14 million AUM is estimated as feed requirements for the beef breeding herd. Requirements for dairy and beef young stock will be presented following the discussion of dairy cattle.

#### Dairy Cattle

Average milk production per cow for the state is about 14,150 pounds per year. However, this average hides a tremendous range in individual performance as evidenced by the fact that average production for individual counties ranges from less than 6,000 pounds to over 19,000 pounds per cow. To take account of the different feed requirements for varying levels of production, the following procedure was adopted:

Appendix Table A-7

## Beef Breeding Herd: Estimated Feed Requirements, 1976

| Item  | Number of animals | Animal units<br>per head | Estimated feed requirements |                   |
|---|-------------------|--------------------------|-----------------------------|-------------------|
|   |                   |                          | Time on feed                | Total requirement |
|   | 1,000 head        | AU                       | months                      | 1,000 AUM         |
| <u>Northern California<sup>a/</sup></u>             |                   |                          |                             |                   |
| Cows, January 1, 1976                               | (150.3)           | <u>b/</u>                | -                           | -                 |
| Fed all year  | 109.9             | 1.0                      | 12 <sup>c/</sup>            | 1318.8            |
| Deaths  | 1.9               | 1.0                      | 6 <sup>d/</sup>             | 12.0              |
| Culls   | 38.5              | 1.0                      | 8 <sup>d/</sup>             | 308.0             |
| Heifers, January 1, 1976                            | ( 35.7)           | -                        | -                           | -                 |
| Fed all year  | 35.3              | 1.0                      | 12 <sup>c/</sup>            | 423.6             |
| Deaths  | 0.4               | 1.0                      | 6 <sup>c/</sup>             | 2.4               |
| <u>Central and Southern California<sup>a/</sup></u> |                   |                          |                             |                   |
| Cows, January 1, 1976                               | (859.7)           | -                        | -                           | -                 |
| Fed all year  | 628.6             | 1.0                      | 12 <sup>c/</sup>            | 7453.2            |
| Deaths  | 10.9              | 1.0                      | 6 <sup>d/</sup>             | 65.4              |
| Culls   | 220.3             | 1.0                      | 4 <sup>d/</sup>             | 881.2             |
| Heifers, January 1, 1976                            | (204.3)           | -                        | -                           | -                 |
| Fed all year  | 201.7             | 1.0                      | 12 <sup>c/</sup>            | 2420.4            |
| Deaths  | 2.6               | 1.0                      | 6 <sup>c/</sup>             | 15.6              |
| Shipments into California                           | 15.7              | 1.0                      | 6 <sup>c/</sup>             | 94.2              |
| <u>Bulls</u>  |                   |                          |                             |                   |
| Fed all year  | ( 70.0)           | -                        | -                           | -                 |
| Bulls and deaths                                    | 56.0              | 1.25                     | 12 <sup>c/</sup>            | 840.0             |
|   | 14.0              | 1.25                     | 6 <sup>c/</sup>             | 105.0             |
| <u>Total Feed Requirements</u>                      | -                 | -                        | -                           | 13,939.8          |

a/ Northern California includes Lassen, Modoc, Plumas, Shasta and Siskiyou counties in which calving is assumed to occur in Spring; remaining counties (central and southern California) are assumed to calve in Fall.

b/ Dashes indicate data not relevant.

c/ Average time on feed assuming even distribution of deaths, culling and inshipments.

d/ Time on feed assuming culling occurs six months prior to calving in Fall (October) and Spring (February).

Source: California Livestock Statistics (see Appendix Table A-1) distribution of replacements, deaths and culls proportional to cow inventories in counties listed in footnote a/.



Appendix Figure A-1

Estimated Distribution of Beef Cattle, California, 1976  
(All Data in Thousand Head)

| Item                                   | Beginning Inventory<br>January 1, 1976 | MONTH       |  |            | Ending Inventory<br>January 1, 1977 |
|--|--|-------------|--|------------|-------------------------------------|
|  |  | April       | June   | August     |                                     |
| <b>Northern California</b>             |  |             |  |            |                                     |
| Cows                                   | 150.3                                  |             | 2.0 deaths   | 38.5 culls | 145.1                               |
| Heifers                                | 35.7                                   |             | .4 deaths  |            |                                     |
| <b>Central and Southern California</b> |  |             |  |            |                                     |
| Cows                                   | 859.7                                  | 220.3 culls | 10.9 deaths  |            | 830.2                               |
| Heifers                                | 204.3                                  |             | 2.6  |            |                                     |
| Inshipments                            |  |             |  |            | 15.7                                |
| <b>Totals</b>                          | 1010                                   | 240         | Cow deaths 12.9; culls and sales 258.8; heifer deaths 13.1 culls |            | 3.0                                 |
| <b>Bulls</b>                           | 70                                     |             |  | .9 deaths  | 56                                  |

Source: California Livestock Statistics, see Appendix Tables A-1 and A-2.

1. Five groups of annual milk yield per lactation period of 44 weeks were specified; namely 7,000, 11,000, 14,000, 17,000 and 21,000 pounds (see Appendix Table A-8).
2. Average daily milk yield for each week of lactation for each group was estimated using standard lactation curves. For example, the low-yield group of 7,000 pounds produces for 44 weeks with an average daily yield of 22.73 pounds of milk.
3. The minimum TDN per 100 pounds of dry weight of the ration are specified as 65, 70, and 75 pounds associated with average daily milk production (3.5 percent fat) of 30, 50, and 65 pounds, respectively. For example, group 3 cows (14,000 pounds annually) are fed for 10 weeks a ration with 75 percent TDN; 10 weeks at 70 percent TDN; and 24 weeks at 65 percent TDN.
4. The TDN requirement for each sub-period is based on 0.304 pounds TDN per pound of milk produced plus a maintenance requirement for a lactating cow (1,300 pounds) of 9.29 pounds TDN per day. A sample calculation is provided in footnote (b), Appendix Table A-8.
5. Total TDN requirements for each lactation group (Appendix Table A-9) are calculated for an estimated distribution of lactations between groups based on average reported yields and cow numbers for individual counties adjusted to obtain state totals for milk production and number of lactations. The latter is taken as 811,000 which is the reported average number through the year of cows and heifers which have calved. Also included are feed requirements for 810,000 dry periods (10 weeks) based on cow inventory and requirements for 15,000 bulls as described in Appendix Table A-2.

Appendix A-8

Dairy Cows: Estimated TDN Requirements Per Cow For Lactation Periods, With Varying Annual Milk Yields

| 44-Week lactation yield by group |            | Estimated TDN requirements per lactation sub-period, with the minimum TDN concentration, in pounds per 100 pounds of dry weight ration of: <sup>a/</sup> |                     |                                 |                 |                     |                                 |            |                     |                                 |
|----------------------------------|------------|--|---------------------|---------------------------------|-----------------|---------------------|---------------------------------|------------|---------------------|---------------------------------|
|                                  |            | 65   |                     |                                 | 70              |                     |                                 | 75         |                     |                                 |
| Group                            | Milk yield | Sub-period   | Daily average yield | TDN requirements per sub-period | Sub-period      | Daily average yield | TDN requirements per sub-period | Sub-period | Daily average yield | TDN requirements per sub-period |
| no.                              | pounds     | weeks  | pounds              | pounds                          | weeks           | pounds              | pounds                          | weeks      | pounds              | pounds                          |
| 1                                | 7,000      | 44   | 22.73               | 4,989.6 <sup>b/</sup>           | - <sup>c/</sup> | -                   | -                               | -          | -                   | -                               |
| 2                                | 11,000     | 34   | 31.10               | 4,461.2                         | 10              | 51.41               | 1,744.3                         | -          | -                   | -                               |
| 3                                | 14,000     | 24   | 32.73               | 3,232.3                         | 10              | 56.00               | 1,841.0                         | 10         | 65.43               | 2,042.7                         |
| 4                                | 17,000     | 17   | 34.23               | 2,347.1                         | 10              | 55.53               | 1,832.0                         | 17         | 75.87               | 3,850.2                         |
| 5                                | 21,000     | 10   | 38.91               | 1,478.3                         | 10              | 53.94               | 1,798.1                         | 24         | 86.42               | 5,974.4                         |

<sup>a/</sup> Minimum ration TDN concentrations are set at 65, 70, and 75 pounds of TDN per 100 pounds of feed for daily milk yield of 30, 50, and over 65 pounds, respectively.

<sup>b/</sup> Calculated according to National Research Council Requirements of 0.304 lbs. TDN per lb. of milk produced plus maintenance requirement for lactating cow (1300 lbs.) of 9.29 lbs. TDN per day. Average daily yield for each week of lactation for each group has been estimated using standard lactation curves. Sample calculation is: no. of weeks (44) times days per week (7) times (average daily yield (22.73) times TDN per lb. (.304) plus maintenance (9.29)) = 4989.6.

<sup>c/</sup> Dashes indicate data not relevant.

Source: Nutrient Requirements of Dairy Cattle, 5th revised edition 1978, N.R.C. Washington. California Dairy Industry Statistics, 1977. Crop and Livestock Reporting Service, Sacramento.

Appendix Table A-9  
Dairy Cattle: Estimated Total TDN Requirements  
California, 1976

| Item            | Number of<br>animals <sup>a/</sup> | TDN concentration/requirement,<br>lactating cows |            |                 |            |         |            | Other      |            |
|-----------------|------------------------------------|--|------------|-----------------|------------|---------|------------|------------|------------|
|                 |                                    | 65   |            | 70              |            | 75      |            | 60         |            |
|                 |                                    | Per cow  | Total      | Per cow         | Total      | Per cow | Total      | Per animal | Total      |
|                 | 1,000                              | lbs.   | 1,000 lbs. | lbs.            | 1,000 lbs. | lbs.    | 1,000 lbs. | lbs.       | 1,000 lbs. |
| Lactation group |                                    |  |            |                 |            |         |            |            |            |
| 1               | 31                                 | 4,990  | 154,678    | - <sup>b/</sup> | -          | -       | -          | -          | -          |
| 2               | 167                                | 4,461  | 745,015    | 1,744           | 291,298    | -       | -          | -          | -          |
| 3               | 373                                | 3,232  | 1,205,648  | 1,842           | 687,058    | 2,043   | 761,908    | -          | -          |
| 4               | 207                                | 2,347  | 485,844    | 1,832           | 397,220    | 3,850   | 796,987    | -          | -          |
| 5               | 33                                 | 1,478  | 48,784     | 1,798           | 59,339     | 5,974   | 197,154    | -          | -          |
| Dry period      | 810                                | -  | -          | -               | -          | -       | -          | 676        | 547,949    |
| Bulls           | 15                                 | -  | -          | -               | -          | -       | -          | 2,920      | 43,800     |
| Total           | -                                  | -  | 2,639,969  | -               | 1,416,916  | -       | 1,756,049  | -          | 591,749    |

a/ California Dairy Industry Statistics report average number during the year of cows and heifers that have calved as 811,000. Although this is greater than inventory levels at the beginning or end of the year, it is assumed to be a more accurate reflection of numbers of lactations since culling would normally occur towards the end of lactation. The number of dry periods is taken as 810,000.

b/ Dashes indicate data not relevant.

Source: California Dairy Industry Statistics--see Appendix Table A-8.

Appendix Figure A-2

Estimated Distribution of Calves and Young Stock, California, 1976  
(All Data in Thousand Head)

| Item                 | Beginning Inventory<br>January 1, 1976 | Month |      |      |      |     |      |      |      |       |      |      |      | Ending Inventory<br>January 1, 1977              |
|----------------------|--|-------|------|------|------|-----|------|------|------|-------|------|------|------|--|
|                      |  | Jan.  | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |  |
| <b>Beef Calves:</b>  |  |       |      |      |      |     |      |      |      |       |      |      |      |  |
| Northern             |  |       |      |      |      |     |      |      |      |       |      |      |      |  |
| Central and Southern | 711.3                                  |       |      |      |      |     |      |      |      |       |      |      |      | 210 replacements<br>472 stockers<br>687.1 calves |
| Stocker Cattle       | 410                                    |       |      |      |      |     |      |      |      |       |      |      |      |  |
| Dairy Calves         | 453.7                                  |       |      |      |      |     |      |      |      |       |      |      |      | 315 replacements<br><br>382.9 calves             |
| <b>Totals</b>        | <b>410</b>                             |       |      |      |      |     |      |      |      |       |      |      |      | <b>525</b>                                       |
| Replacement Cattle   | 1165                                   |       |      |      |      |     |      |      |      |       |      |      |      | 472  |
| Stocker Calves       |  |       |      |      |      |     |      |      |      |       |      |      |      | 1070   |
| Feedlot Cattle       | 960                                    |       |      |      |      |     |      |      |      |       |      |      |      | 812  |

| Item                              | Beginning Inventory | Month  | Ending Inventory                             |
|-----------------------------------|---------------------|--|--|
| Beef Calves: Northern             |                     | 133 born (Jan), 12.8 deaths (Mar), 54 sold (July), 120.2 weaned (Oct)                                |  |
| Beef Calves: Central and Southern | 711.3               | 8.9 deaths (Feb), 702.4 weaned (May), 86.6 surplus (Aug), 760.5 born (Oct), 73.4 deaths (Dec)        | 210 replacements, 472 stockers, 687.1 calves |
| Stocker Cattle                    | 410                 | 5.1 deaths (Feb), 404.9 surplus (Apr)  |  |
| Dairy Calves                      | 453.7               | 5.7 deaths (Feb), 133 surplus (Mar), 69.2 deaths (July), 716.5 born (Jan), 264.4 surplus (Sept)      | 315 replacements, 382.9 calves               |
| Totals                            | 410                 | Calf births 1610, Surplus calves and stockers 942.9, Calf deaths: From Inventory 14.6, Newborn 155.4 | 525  |
| Replacement Cattle                | 1165                |  | 472  |
| Stocker Calves                    |                     |  | 1070   |
| Feedlot Cattle                    | 960                 | 28.5 deaths (July), 1724.5 net placements (Jan), 1844 marketed (Dec)                                 | 812  |

Source: California Livestock Statistics see Appendix Table A-1

### Young Cattle

Feed requirements for young stock are calculated as before in terms of animal unit months for grazing animals and total digestible nutrients for animals in confinement.

A number of assumptions concerning the disposition of young stock have to be made in order to arrive at these estimates. Some are simplifications in the sense of aggregating known variations; others are necessary simply because of a lack of quantitative information. Major assumptions include the following.

It is assumed that all beef calves remain with the breeding herd on rangeland or other grazing until weaning in September in the northeastern counties or June in the remainder of the state. This implies that calves are weaned between seven and eight months of age on average and that they consume significant amounts of forage for approximately five months. These calves are either retained as replacements, in which case they remain on grazing, or are (retained or) sold as stocker cattle to both out-of-state and in-state operations. California-born calves remaining in state may enter feedlots at a later date but it is assumed that few are placed on feed in California directly at weaning. The feedlot industry is divided into two components; the feedlots of Imperial County, and the remainder mainly in the San Joaquin Valley and central and southern coastal regions. Sources of feeder cattle include primarily mixed weight cattle shipped in mainly from Arizona, Nevada, Texas and the Southeastern states [California Livestock Statistics, 1977]; medium to heavy weight feeders from California and the Northwest; and surplus dairy calves. The vast majority of cattle on feed in Imperial County originate from out of state with some light weight dairy calves coming in from

other areas in California. Most of the heavier weight California-born calves and stockers, if they remain in state, and the remainder of the dairy calves are fed out in the San Joaquin and along the coastal range. The average market weight for all feedlots is assumed to be 1,050 lbs. For simplicity, two in-weights are assumed: 500 lbs. average for calves, and 700 lbs. for stockers and feeders. Based on numbers of animals in feedlots in different weight classes reported in Cattle on Feed, 60 percent of all animals are assumed to enter at 500 lbs. and 40 percent at 700 lbs.

Information on the disposition of dairy calves not retained as replacements is extremely limited. It is assumed that most of the 356,000 head of calves slaughtered in the state are surplus dairy calves. These arise from two main sources; specialist white veal operations which probably account for a fairly small proportion and other calf raising operations which market animals either as vealers or to feedlots depending on market conditions. Surplus calves are normally collected from dairies within the first two weeks of life and are raised on milk replacers and increasing amounts of dry feeds. Slaughter weights vary considerably, particularly where there is flexibility in marketing as veal or to feedlots. An average and somewhat arbitrary weight of 250 lbs. is assumed.

The estimated distribution of all young cattle is illustrated in Figure A-2. Feed requirements of beef calves and stockers are shown in Table A-10 calculated separately for surviving animals and for losses as with the beef herd. All surviving spring-born calves in the northeastern counties (120,200) are assumed to be on hand as stockers or replacements at the end of the year the remainder of the ending inventory of stockers and replacements (561,800) are assumed to be calves born in central and southern areas in Fall 1975 and

Appendix Table A-10

## Beef Calves and Stockers: Estimated Feed Requirements, California, 1976

| Item                                     | Number of animals     | Estimated Feed Requirement |              |                   |
|--|-----------------------|----------------------------|--------------|-------------------|
|  |                       | Animal units per head      | Time on feed | Total requirement |
|  |                       | 1,000 head                 | months       | 1,000 AUM         |
| <u>Northern California</u>               |                       |                            |              |                   |
| Calves born February 1976                | (13.3) <sup>a/</sup>  | - <sup>b/</sup>            | -            | -                 |
| Grazed until weaned at eight months      | 120.2                 | .4                         | 5            | 240.4             |
| Deaths                                   | 12.8                  | .4                         | 1            | 5.1               |
| Grazed as stockers and replacements      | 120.2 <sup>c/</sup>   | .6                         | 3            | 216.4             |
| <u>Central and Southern California</u>   |                       |                            |              |                   |
| Calf inventory January 1, 1976           | (711.3) <sup>d/</sup> | -                          | -            | -                 |
| Grazed until weaning at eight months     | 702.4                 | .4                         | 5            | 1404.8            |
| Deaths                                   | 8.9                   | .4                         | 1            | 3.6               |
| Sold at weaning                          | 54 <sup>e/</sup>      | -                          | -            | --                |
| Grazed as stockers and replacements      | 561.8 <sup>c/</sup>   | .6                         | 6            | 2022.5            |
| Surplus stockers                         | 86.6 <sup>f/</sup>    | .6                         | 4            | 207.8             |
| Calves born October 1976                 | (760.5) <sup>a/</sup> | -                          | -            | -                 |
| <u>Stocker Inventory January 1, 1976</u> | (410.0)               | -                          | -            | -                 |
| Grazed until sale                        | 404.9                 | .6                         | 2            | 485.9             |
| Deaths                                   | 5.1                   | .6                         | 1            | 3.1               |
| <u>Total Feed Requirements</u>           | -                     | -                          | -            | 4589.6            |

a/ Distribution of calf births between Northern and remaining counties proportional to cow inventory as described in Table A-7. Calves born in Central and Southern counties are assumed to have no grazing requirement since they are less than three months of age by the end of the year--see Figure A-2.

b/ Dashes indicate data not relevant.

c/ Ending inventory of replacements and stocker cattle is (210,000 + 472,000) 682,000; all Northern counties calves weaned in September (120,200) are assumed to be on hand as replacements or stockers at the end of the year; other replacements and stockers (561,800) are assumed to be animals retained from the January 1, 1976 calf inventory--see footnote d/.

d/ Estimate of surviving beef calves born October 1975.

e/ California Livestock Statistics report marked increases in cattle and calf outshipments in April, May and June which coincides with weaning of Fall-born calves. Calves marked and not slaughtered (410,000 - 356,000) 54,000 are assumed to be beef calves shipped out at weaning.

f/ Central and Southern calves not identified as outshipments or replacements and stockers are assumed to be grazed for an average of four months before disposition as feeders.

Source: California Livestock Statistics (see Appendix Table A-1). See also Appendix Figure A-2.



listed in the beginning inventory in 1976. The Fall 1976 calf crop in central and southern California is assumed to have no feed requirements during 1976 since they are less than three months of age by the end of the year. Animals from the beginning calf inventory (estimated as 711,300) which are not on hand as stockers and replacements as described above are assumed to be death losses (8,900) requiring only one month of feed on average; sold at weaning (54,000) or stocked after weaning for an average of four months (86,600). The beginning inventory of stocker cattle (410,000) adjusted for death losses is assumed to be grazed for an average of two months before disposition as feeders.

Feed requirements in pounds TDN for both dairy calves and feedlot animals are shown in Appendix Table A-11. TDN requirements are based on recommended daily allowances published by the National Research Council (Nutrient Requirements of Dairy Cattle, 1978; Nutrient Requirements of Beef Cattle, 1976). For dairy calves monthly requirements were calculated from three weeks to 15 months of age assuming an average growth rate of 1.5 lbs./day; assumptions were made regarding the average age and length of feeding for each group as described below, and total requirements were summed from the appropriate monthly amounts. A similar procedure was utilized for feedlot cattle except that requirements were calculated for 100 lb. weight increases rather than increases in age, and two feeding regimes are assumed; a growing ration of 70 percent TDN giving 2.0 lbs./day gain from 500 to 700 lbs., and a fattening ration of 75 percent TDN giving 2.9 lbs./day gain from 700 to 1050 lbs.

Dairy calves on hand at the beginning of 1976 (453,700) are assumed to be a mixture of those to be retained as replacements and surplus calves raised for veal or sale to feedlots. Average age is assumed to be three months so

Appendix Table A-11

## Feedlot Cattle and Dairy Calves: Estimated Feed Requirements, California, 1976

| Item                                      | Number of animals | Time on feed    | TDN concentration requirement <sup>c/</sup> |      |                   |            |
|---|-------------------|-----------------|---|------|-------------------|------------|
|   |                   |                 | TDN per animal                              |      | Total requirement |            |
|   |                   |                 | 70  | 75   | 70                | 75         |
|   | 1,000             | months          | lbs.  | lbs. | 1,000 lbs.        | 1,000 lbs. |
| <b>Dairy Calves<sup>a/</sup></b>          |                   |                 |   |      |                   |            |
| Calf inventory, January 1, 1976           | (453.7)           | - <sup>b/</sup> | -   | -    | -                 | -          |
| Retained as replacements, January 1, 1977 | 315.0             | 12              | 2742  | -    | 863,730           | -          |
| Deaths                                    | 5.7               | 1               | 126   | -    | 718               | -          |
| Surplus                                   | 133.0             | 2               | 273   | -    | 36,309            | -          |
| Calves born during 1976                   | (716.5)           | -               | -   | -    | -                 | -          |
| Calf inventory, January 1, 1977           | 382.9             | 3               | 218   | -    | 83,472            | -          |
| Deaths                                    | 69.2              | 1               | 35  | -    | 2,422             | -          |
| Surplus                                   | 264.4             | 5               | 491   | -    | 128,820           | -          |
| <b>Total feed requirements</b>            | -                 | -               | -   | -    | 1,115,471         | -          |
| <b>Feedlot Cattle<sup>a/</sup></b>        |                   | days            |   |      |                   |            |
| Finished in 1976                          |                   |                 |   |      |                   |            |
| Beginning inventory, January 1, 1976      | 960.0             | 94              |   | 1482 | -                 | 1,422,720  |
| Placed on feed                            | 844.0             | 188             | 654   | 2004 | 578,136           | 1,771,536  |
| Not finished                              |                   |                 |   |      |                   |            |
| Ending inventory, January 1, 1977         | 812.0             | 94              | 654   | 522  | 531,048           | 423,864    |
| Deaths                                    | 28.5              | 94              | 654   | 522  | 18,639            | 14,877     |
| <b>Total feed requirements</b>            | -                 | -               | -   | -    | 1,127,823         | 3,632,997  |

<sup>a/</sup> See Appendix Figure A-3 for assumed supply and distribution of animals.

<sup>b/</sup> Dashes indicate data not relevant.

<sup>c/</sup> Ration TDN concentrations and methods of calculating requirements per animal are described in text.

Sources: Animal Numbers, California Livestock Statistics--see Appendix Table A-1.

Feed requirements, Nutrient Requirements of Dairy Cattle, 5th edition, 1978; Nutrient Requirements of Beef Cattle, 5th edition, 1976, NRC Washington.

that animals listed in the ending inventory as replacements (315,000) require 12 months of feeding (from three to 15 months of age) and surplus calves (133,000) are fed from three to five months. Calves born during 1976, adjusted for death losses supply 382,900 as ending inventory with an average age of three months (fed from three weeks to three months) and 264,400 surplus calves fed to five months. Requirements for feedlot cattle are calculated for four groups as shown in Table A-11. Within each group, 60 percent are assumed to be animals placed on feed at 500 lbs. and 40 percent are assumed to be placed at 700 lbs. Days on feed and total TDN requirement per animal are the weighted means of these values calculated as described above. Thus the beginning inventory of 960,000 is assumed to comprise 60 percent animals fed for 116 days (half the estimated feeding period of 232 days) and requiring 1764 lbs. of 75 percent TDN ration, and 40 percent animals fed for 61 days (feeding period 122 days), requiring 1060 lbs. of the same ration giving a weighted mean of 94 days and 1482 lbs. of feed.

### Sheep

Feed requirements are estimated for various categories of sheep as shown in Appendix Table A-12. Assumptions underlying these data are as follows. Lambing occurs more or less continuously from about November to March, with a mean date of January. The average breeding date is then mid-August, and culling is specified to occur about 1-1/2 months after lambing. Of the 840,000 ewes and rams on hand January 1, 1976, deaths account for 60,000, culls an additional 128,000 and the remainder (652,000) plus replacements (108,000) and inshipped breeding stock (37,000) form the inventory at the end of the year (797,000). All animals are on feed for 12 months except for culls

Appendix Table A-12

Sheep: Estimated Feed Requirements In  
Animal Unit Months, California, 1976

| Item                           | Number of animals | Feed requirements |              |              |
|--------------------------------|-------------------|-------------------|--------------|--------------|
|                                |                   | Per animal        | Time on feed | Total        |
|                                |                   | AU                | months       | 1,000 AUM    |
|                                | 1,000             |                   |              |              |
| Ewes and Rams                  | (840)             |                   |              |              |
| Inventory January 1, 1976      | 652               | 0.20              | 12.0         | 1,564.8      |
| Deaths                         | 60                | .20               | 6.0          | 72.0         |
| Culls (marketings)             | 128               | .20               | 1.5          | 38.4         |
| Replacements                   | (108)             |                   |              |              |
| Ewes                           | 89                | .20               | 12.0         | 213.6        |
| Rams                           | 19                | .20               | 12.0         | 45.6         |
| Inshipments-breeding           | 37                | .2                | 5.5          | 81.4         |
| Lambs docked                   | (738)             |                   |              |              |
| On pasture                     | 671               | .10               | 3.0          | 201.3        |
| Deaths                         | 67                | <u>a/</u>         | <u>a/</u>    | <u>a/</u>    |
| Lambs Retained as Replacements | 103               | .15               | 6.0          | 92.7         |
| Feeder Lambs                   | <u>460</u>        | <u>.15</u>        | <u>3.0</u>   | <u>207.0</u> |
| Total feed requirements        | - <u>b/</u>       | -                 | -            | 2,516.8      |

a/ Death is assumed to occur prior to requiring feed other than that required by ewes.

b/ Dashes indicate data not relevant.

Source: California Livestock Statistics, see Appendix Table A-1.

(1.5 months as noted above), deaths are assumed to occur at mid-year (six months on feed), and breeding stock shipped into California are assumed to be at mid-July or one month prior to breeding, (on feed for 5-1/2 months). The flow of sheep and lambs is illustrated in Appendix Figure A-3.

Lamb feed requirements are for animals on pasture for three months (671,000).

### Hogs and Pigs

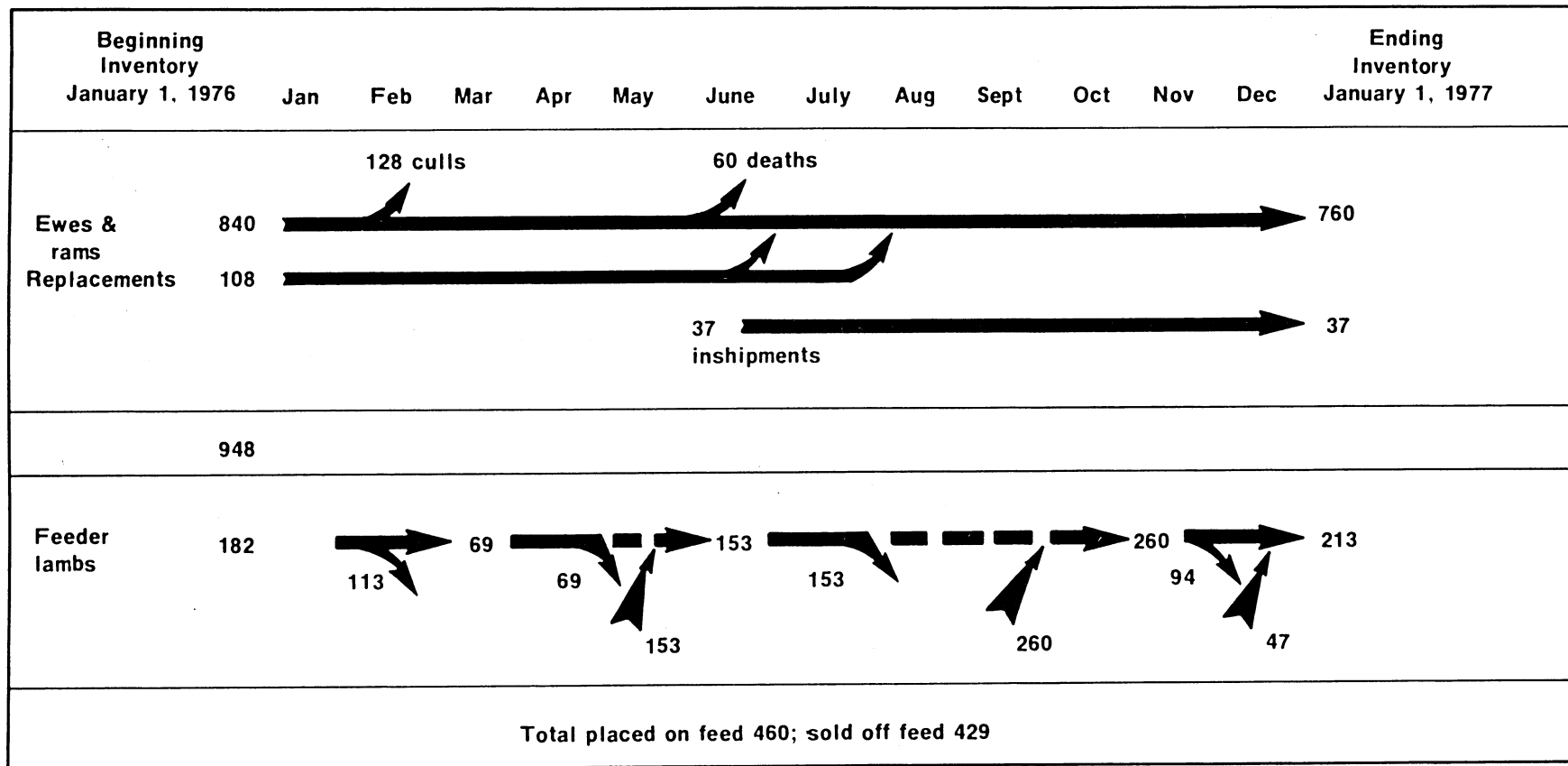
Numbers of farrowings are reported for two periods of the year; December 1 to June 1 (15,000) and June 1, to December 1 (14,000). Feed requirements for lactating sows, as given by the National Research Council report Nutrient Requirements of Swine, 1973, are 8.7 pounds of TDN per day and 3.3 pounds per day for all other breeding stock (TDN concentration of 75 pounds of TDN per 100 pounds of feed). Piglets are assumed to be weaned at 30 days; thus, sows are on the higher feed requirements for 30 days and on the lower requirements for the remainder of the six-month period (see Appendix Table A-13).

The number of breeding pigs on December 1, 1975 was reported as 26,000 and as 24,000 as of December 1, 1976. We estimate the June 1 number to be 25,000 or the average of these figures. This allows yearly data on other breeding stock, culls and deaths, and animals shipped into California, to be allocated between the two periods in proportion to numbers of breeding pigs (see Appendix Table A-13). The feeding period for inshipped animals and culls and deaths is three months, or one-half of the six-month period (see Appendix Figure A-4).

Feed requirements for market hogs are based on a fattening period of 115 days, starting at 40 pounds liveweight and finishing at 220 pounds. This period is divided into three stages as follows:

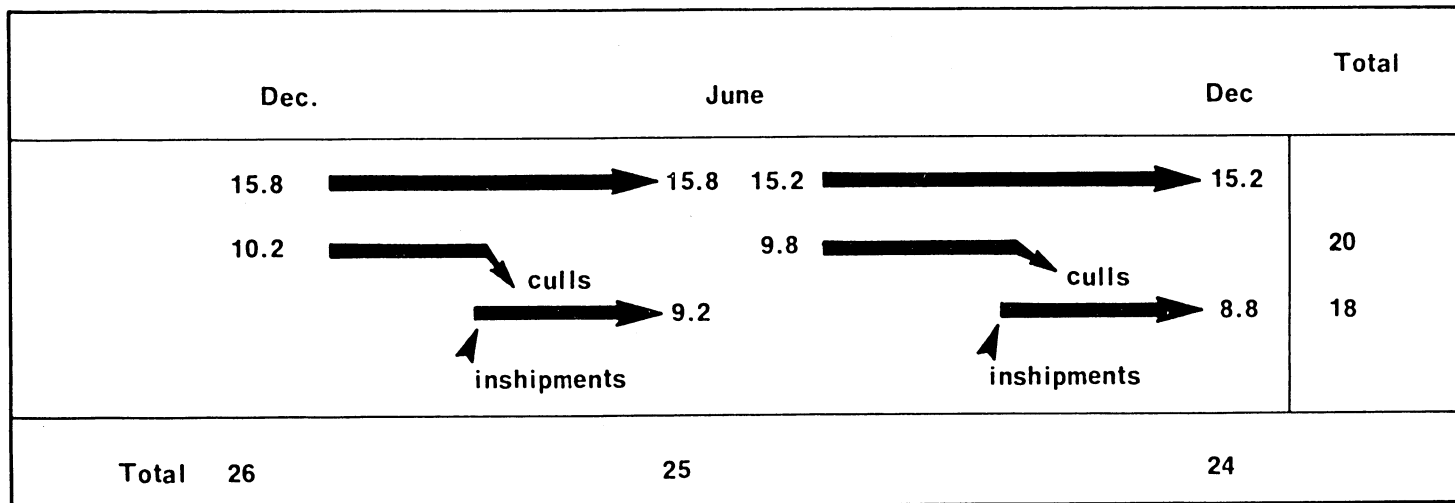
Appendix Figure A-3

Estimated Distribution of Sheep and Lambs  
(All Data in Thousand Head)



Source: California Livestock Statistics, see Appendix Table A-1.

**Appendix Figure A-4  
Estimated Distribution of Breeding Pigs**



Source: California Livestock Statistics, see Appendix Table A-1.

Appendix Table A-13

Breeding Pigs: Estimated Feed Requirements in  
Total Digestible Nutrients, California, 1976

| Item                                 | December 1, 1975-June 1, 1976 |                   |                 |                | June 1, 1976-December 1, 1976 |                   |                 |                |
|--------------------------------------|-------------------------------|-------------------|-----------------|----------------|-------------------------------|-------------------|-----------------|----------------|
|                                      | Number                        | Feed              |                 |                | Number                        | Feed              |                 |                |
|                                      |                               | Amount<br>per day | Time<br>on feed | Total          |                               | Amount<br>per day | Time<br>on feed | Total          |
|                                      | 1,000                         | TDN               | days            | 1,000 TDN      | 1,000                         | TDN               | days            | 1,000 TDN      |
| Breeding Pigs                        | (26.0)                        | - <sup>a/</sup>   | -               | -              | (25.0)                        | -                 | -               | -              |
| Lactating sows                       |                               |                   |                 |                |                               |                   |                 |                |
| Before weaning                       | 15.0                          | 8.7               | 30              | 3,915.0        | 14.0                          | 8.7               | 30              | 3,654.0        |
| After weaning                        | 15.0                          | 3.3               | 152             | 7,425.0        | 14.0                          | 3.3               | 152             | 6,930.0        |
| Other breeding stock                 | 0.8                           | 3.3               | 182             | 480.5          | 1.2                           | 3.3               | 182             | 720.7          |
| Culls and deaths                     | 10.2                          | 3.3               | 91              | 3,063.1        | 9.8                           | 3.3               | 91              | 2,942.9        |
| Shipped into California for Breeding | <u>9.2</u>                    | <u>3.3</u>        | <u>91</u>       | <u>2,762.8</u> | <u>8.8</u>                    | <u>3.3</u>        | <u>91</u>       | <u>2,642.6</u> |
| Total (6 months) feed requirements   | -                             | -                 | -               | 17,646.4       | -                             | -                 | -               | 16,890.2       |
| Total (year) feed requirements       | -                             | -                 | -               | -              | -                             | -                 | -               | 34,536.6       |

<sup>a/</sup> Dashes indicate data not relevant.

Source: Number of farrowings: California Livestock Statistics (see Appendix Table A-1).  
Feed requirements: Nutrient Requirements of Swine, 7th edition, 1973, NRC Washington.



| <u>Weight</u><br><u>Lbs.</u> | <u>Time on Feed Days</u><br><u>Days</u> | <u>TDN Per Day</u><br><u>Lbs.</u> |
|------------------------------|---|-----------------------------------|
| 40-75                        | 30                                      | 2.8                               |
| 75-125                       | 32                                      | 4.2                               |
| 125-220                      | 53                                      | 5.8                               |

These feed requirements were used to calculate total requirements for numbers of animals, by weight class, in the beginning and ending inventories and for pigs finished during the year but not reported in the beginning inventory. A feed allowance is calculated also for deaths assumed to occur, on the average, half-way through the 115 day feeding period (see Appendix Table A-14).

### Poultry

Feed requirements are presented for four types of poultry; namely, the egg laying flock, broilers and fryers, turkeys and the turkey breeding flock. Poultry numbers are from Appendix Table A-6 and here estimates are given for time on feed, feed per bird and total feed requirements in terms of total digestible nutrients.

The laying flock feed use is primarily by hens and pullets of laying age, as shown in Appendix Table A-15. Feed requirements are based on an average production per bird of 225 eggs a year for an average flock size of 37,522,000, with replacements, culls, and deaths assumed to occur about at mid-year. Numbers of replacement pullets fed are estimated as explained in Appendix Table A-15. Time on feed for those in the beginning inventory is ten weeks, or from age of 10 weeks to age of 20 weeks when birds become layers. The number raised during the year includes those reaching laying age plus those in the year end inventory not of laying age.

Appendix Table A-14

Market Hogs: Estimated Feed Requirements in Total Digestible Nutrients, California, 1976

| Item  | Number of animals<br>1,000 head | Feed requirements |                 |           |
|---|---------------------------------|-------------------|-----------------|-----------|
|   |                                 | Time on feed      | Feed per animal | Total     |
|   |                                 | days              | TDN             | 1,000 TDN |
| Beginning inventory (12/1/75) by weight class<br>(pounds)   |                                 |                   |                 |           |
| Less than 60  | 44.0                            | 115               | 523.3           | 23,026    |
| 60-120  | 26.0                            | 82                | 426.6           | 11,092    |
| 120-180   | 22.0                            | 39                | 225.7           | 4,965     |
| 180-220   | 16.0                            | 11                | 637.0           | 1,018     |
| Over 220  | 4.0                             | a/                | a/              | a/        |
| Total   | 112.0                           | - b/              | -               | -         |
| Pigs finished during year but not in beginning<br>Inventory | 83.8 <sup>c/</sup>              | 115               | 523.3           | 43,856    |
| Ending inventory (12/1/76) by weight class<br>(pounds)      |                                 |                   |                 |           |
| Less than 60  | 44.0                            | d/                | d/              | d/        |
| 60-120  | 28.0                            | 33                | 96.7            | 2,708     |
| 120-180   | 20.0                            | 76                | 297.6           | 5,952     |
| 180-220   | 14.0                            | 104               | 459.7           | 6,435     |
| Over 200  | 3.0                             | 115               | 523.3           | 1,569     |
| Total   | 109.0                           | -                 | -               | -         |
| Deaths  | 20.4                            | 58                | 200.1           | 4,081     |
| Total feed requirements                                     | -                               | -                 | -               | 104,704   |

a/ Assumes animals are slaughtered.

b/ Dashes indicate data not relevant.

c/ Calculated as total marketings plus farm slaughter (188,600) plus death of pigs on hand in beginning inventory (7,200) less pigs on hand in beginning inventory (112,000).

d/ Assumes no dry feed needed.

Source: Inventory numbers: California Livestock Statistics (see Appendix Table A-1)Feed requirements: Nutrient Requirements of Swine (see Appendix Table A-13)

Appendix Table A-15

Poultry: Estimated Feed Requirements in Total Digestible Nutrients,  
California, December 1, 1975

| Item   | Number of Birds        | Feed Requirements               |               |           |
|--|------------------------|---------------------------------|---------------|-----------|
|  |                        | Age range or total time on feed | Feed per bird | Total     |
|  | 1,000                  | Weeks                           | TDN           | 1,000 TDN |
| <b>Laying Flock</b>  |                        |                                 |               |           |
| Hens and pullets of laying age, December 1, 1975               | 37,552                 | (52)                            | 59.30         | 2,226,834 |
| Pullets reaching laying age during year in beginning inventory | (21,962) <sup>a/</sup> | - <sup>b/</sup>                 | -             | -         |
| raised during the year   | 10,139 <sup>c/</sup>   | 10-20                           | 9.17          | 92,940    |
| Pullets not of laying age December 1, 1976                     | 11,823 <sup>c/</sup>   | 0-20                            | 15.19         | 179,576   |
| Pullet death losses  | 9,019                  | 0-10                            | 6.02          | 54,313    |
| Total  | 3,789 <sup>d/</sup>    | 0-10                            | 6.02          | 22,817    |
|  | -                      | -                               | -             | 2,576,480 |
| <b>Broilers and Fryers</b>                                     |                        |                                 |               |           |
| Broilers produced  | (104,950)              | -                               | -             | -         |
| Hatched in November, 1975                                      | 17,043                 | 5-8                             | 5.15          | 87,744    |
| Hatched and raised, 1976                                       | 87,907                 | 0-8                             | 7.05          | 620,050   |
| Hatched and died, 1976   | 7,779                  | 0-4                             | 1.91          | 14,820    |
| Ending inventory-eggs hatched in December, 1976                | 17,580                 | 0-4                             | 1.91          | 33,492    |
| Total  | -                      | -                               | -             | 756,106   |
| <b>Turkeys</b>   |                        |                                 |               |           |
| Turkeys raised   | (17,514)               | -                               | -             | -         |
| Hatched in September-November 1975                             | 3,357                  | 12-24                           | 39.13         | 131,359   |
| Hatched and raised, 1976                                       | 14,157                 | 0-24                            | 55.09         | 779,901   |
| Hatched and died, 1976   | 2,460                  | 0-12                            | 15.96         | 39,262    |
| Ending inventory-eggs hatched in September-November, 1976      | 3,701                  | 0-12                            | 15.96         | 59,068    |
| Total  | -                      | -                               | -             | 1,009,590 |
| <b>Turkey Breeding Flock</b>                                   |                        |                                 |               |           |
| Breeder hens, December 1, 1975                                 | 700                    | (26)                            | 76.4          | 53,475    |
| Replacement flock  | 600                    | 24-39                           | 35.3          | 21,155    |
| Total feed requirements  | -                      | -                               | -             | 74,630    |

a/ Estimated as shown in Appendix Table A-6.

b/ Dashes indicate data are not relevant.

c/ Calculated as number of pullets reaching laying age during year less numbers in beginning inventory.

d/ Death losses plus pullets not of laying age as of December 1, 1976 plus pullets raised during the year are equal to total placements reported in Appendix Table A-6.

Sources: Numbers are from Appendix Table A-6 except where noted.

Feed requirements: Nutrient Requirements of Poultry, 6th Edition, 1971, NRC Washington.

Rooney, W. F. (1976) Chicken Fryer Production: Management, Costs and Returns. Leaflet 2648. University of California, Division of Agricultural Science.

Schroeder, J. P., undated, Turkey Feed Consumption, University of California, Division of Agricultural Sciences Extension leaflet.

Broiler feed estimates are based on reported numbers produced of 104,950. Beginning and ending year inventory data and estimated death losses are as explained in conjunction with Appendix Table A-6. The feed requirements are given in Appendix Table A-15. Similar comments apply to turkeys raised.

Feed requirements for breeding turkeys are calculated on the assumption that each bird produces (and requires feeding) for six months, is then culled and replaced by an incoming bird. The total number of such six-month production periods is taken as 700,000--the beginning inventory. In addition to feed required during production, incoming birds require feeding for a period of 15 weeks beyond that accounted under turkeys hatched and raised to bring them into production. The total number of such additional rearing periods is taken as 600,000, equivalent to the ending inventory.

#### All Livestock and Poultry

A summary of grazing (in animal units) and feed requirements (in total digestible nutrients) is given in Appendix Table 16. As previously mentioned, these estimates are based on estimated requirements per animal multiplied by numbers of animals in each class. Several minor anomalies exist in these estimates which cannot be isolated because of lack of suitable data. The more important of these are as follows. The total AUM of grazing is based on the numbers of animals that are normally maintained or raised in nonconfinement situations, principally the beef herd and nonfeedlot cattle, and the sheep flock. Many of these animals receive supplements at grazing including hay, grains, oil seed meals and liquid supplements. No attempt has been made to separate these feeds from total requirements. Also some classes of animals notably stocker cattle and replacement heifers may be grazed out of state for periods of time. This grazing remains within the estimated requirement.

Appendix Table A-16

## All Livestock and Poultry: Total Feed Requirements, California, 1976

| Item                 | Total TDN requirements by ration:<br>(pounds of TDN per 100 pounds of feed) |         |         |         | Grazing <sup>a/</sup> |
|----------------------|---|---------|---------|---------|-----------------------|
|                      | 60  | 65      | 70      | 75      |                       |
|                      | million pounds (TDN)  |         |         |         | 1,000 AUM             |
| <u>Dairy animals</u> |   |         |         |         |                       |
| Cows                 |   |         |         |         |                       |
| lactating            | -   | 2,640.0 | 1,416.9 | 1,756.0 | -                     |
| dry                  | 547.9   | -       | -       | -       | -                     |
| Heifers, calves      | -   | -       | 1,115.5 | -       | -                     |
| Culls                | 43.8  | -       | -       | -       | 945                   |
| Total                | 591.7   | 2,640.0 | 2,531.4 | 1,756.0 | 3,901                 |
| <u>Beef cattle</u>   |   |         |         |         |                       |
| Feedlot              | -   | -       | 1,127.8 | 3,633.0 | -                     |
| Cows                 | -   | -       | -       | -       | 10,039                |
| Heifers              | -   | -       | -       | -       | 2,956                 |
| Calves, stockers     | -   | -       | -       | -       | 4,590                 |
| Bulls                | -   | -       | -       | -       | 945                   |
| Total                | -   | -       | 1,127.8 | 3,633.0 | 18,530                |
| <u>Sheep, all</u>    | -   | -       | -       | -       | 2,517                 |
| <u>Hogs</u>          |   |         |         |         |                       |
| Breeding herd        | -   | -       | -       | 34.5    | -                     |
| Broilers             | -   | -       | -       | 104.7   | -                     |
|                      | -   | -       | -       | 139.2   | -                     |
| <u>Poultry</u>       |   |         |         |         |                       |
| Layers               | -   | -       | 2,576.5 | -       | -                     |
| Broilers             | -   | -       | -       | 756.1   | -                     |
| Turkeys              | -   | -       | -       | -       | -                     |
| raised               | -   | -       | 1,009.6 | -       | -                     |
| breeding flock       | -   | 74.6    | -       | -       | -                     |
| Total                | -   | 74.6    | 3,586.1 | 756.1   | -                     |
| Total                | 591.7   | 2,674.6 | 7,245.3 | 6,284.3 | 24,948                |

a/ Includes annual rangeland grazing, irrigated pasture, cropped stubble and conserved forages.

Source: Appendix Tables A-7 through A-15.

Finally, grazing includes not only rangeland and irrigated pasture, but temporary grazing, crop stubbles and opportunity feeds of one sort or another--some cull fruit and vegetables, processing wastes, etc.

## APPENDIX B

TABLES OF ESTIMATED COMPOSITION OF RATIONS FOR  
LIVESTOCK AND POULTRY

Table B-1: Dairy Cattle Rations: Estimated Percentage Composition,  
1963, 1973 and 1978.

Table B-2: Heavyweight Feeder Rations: Estimated Percentage Composition,  
1963, 1973 and 1978.

Table B-3: Lightweight Feeder Rations: Estimated Percentage Composition,  
1963, 1973 and 1978.

Table B-4: Feedlot Lamb Rations: Estimated Percentage Composition, 1963  
and 1973.

Table B-5: Swine Rations: Estimated Percentage Composition, 1963 and 1973.

Table B-6: Poultry Rations: Estimated Percentage Composition, 1963, 1973  
and 1978.

Table B-7: Turkey Rations: Estimated Percentage Composition, 1963, 1973  
and 1978.

Appendix Table B-1

Dairy Cattle Rations: Estimated Percentage Composition,  
1963, 1973 and 1978<sup>a/</sup>

| Feed                      | 1963             |                                 | 1973         |                                 | 1978         |                                 |
|---------------------------|------------------|---------------------------------|--------------|---------------------------------|--------------|---------------------------------|
|                           | Concentrates     | Concentrates<br>and<br>roughage | Concentrates | Concentrates<br>and<br>roughage | Concentrates | Concentrates<br>and<br>roughage |
|                           | percent          |                                 |              |                                 |              |                                 |
| <u>Grain</u>              |                  |                                 |              |                                 |              |                                 |
| Barley                    | 20.8             | 4.09                            | 23.2         | 6.56                            | 17.2         | 5.2                             |
| Corn                      | 9.0              | 1.77                            | 10.1         | 2.85                            | 10.1         | 3.0                             |
| Grain sorghum             | 11.5             | 2.26                            | 12.9         | 3.64                            | 12.9         | 3.9                             |
| Wheat                     | -- <sup>b/</sup> | --                              | --           | --                              | 3.0          | 0.9                             |
| Total                     | 41.3             | 8.12                            | 46.2         | 13.05                           | 43.2         | 13.0                            |
| <u>Other concentrates</u> |                  |                                 |              |                                 |              |                                 |
| Cottonseed meal           | 5.0              | 0.98                            | 5.6          | 1.58                            | 5.6          | 1.5                             |
| Other protein feed        | 7.1              | 1.40                            | 3.4          | 0.97                            | 12.4         | 3.3                             |
| Dried beet pulp           | 15.3             | 3.01                            | 17.1         | 4.83                            | 17.1         | 4.6                             |
| Citrus pulp               | 0.4              | .08                             | 0.4          | 0.12                            | 0.4          | 0.1                             |
| Millfeeds                 | 24.2             | 4.76                            | 19.7         | 5.54                            | 13.7         | 3.7                             |
| Minerals and vitamins     | 1.5              | .29                             | 1.8          | 0.52                            | 1.8          | 0.5                             |
| Molasses                  | 5.2              | 1.02                            | 5.8          | 1.64                            | 5.8          | 1.5                             |
| Total                     | 58.7             | 11.54                           | 53.8         | 15.20                           | 56.8         | 15.2                            |
| Total concentrates        | 100.0            | 19.66                           | 100.0        | 28.25                           | 100.0        | 28.2                            |
| <u>Hay or equivalent</u>  | --               | 80.34                           | --           | 71.75                           | --           | 71.8                            |
| Total ration              | --               | 100.00                          | --           | 100.00                          | --           | 100.00                          |

<sup>a/</sup> An estimate of the amount of concentrates per 100 pounds of milk, provided by the Bureau of Milk Stabilization, California Department of Agriculture, is as follows: 1963, 31.61 pounds (3.8 percent milk fat); 1973, 36.71 pounds (3.5 percent milk fat); and 1978,

<sup>b/</sup> Dashes indicate data are not relevant.

Source: Donald L. Bath, Extension Dairyman, University of California, Davis.



Appendix Table B-2

Heavyweight Feeder Rations: Estimated Percentage Composition,  
Statewide Average, 1963, 1973 and 1978<sup>a/</sup>

| Feed                      | 1963         |                           | 1973         |                           | 1978         |                           |
|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|
|                           | Concentrates | Concentrates and roughage | Concentrates | Concentrates and roughage | Concentrates | Concentrates and roughage |
|                           | percent      |                           |              |                           |              |                           |
| <u>Grain</u>              |              |                           |              |                           |              |                           |
| Barley                    | 48.9         | 41.4                      | 21.5         | 18.0                      | 20.0         | 18.0                      |
| Corn                      | 2.0          | 1.7                       | 17.9         | 15.0                      | 16.7         | 15.0                      |
| Grain sorghum             | 17.1         | 14.5                      | 25.0         | 21.0                      | 23.3         | 21.0                      |
| Wheat                     | 0            | 0                         | 7.1          | 6.0                       | 6.7          | 6.0                       |
| Total                     | 68.0         | 57.6                      | 71.5         | 60.0                      | 66.7         | 60.0                      |
| <u>Other concentrates</u> |              |                           |              |                           |              |                           |
| Cottonseed meal           | 2.6          | 2.2                       | b/           | --                        | --           | --                        |
| Other protein             | 5.2          | 4.4                       | --           | --                        | --           | --                        |
| Dried beet or citrus pulp | 11.0         | 9.3                       | 11.9         | 10.0                      | 11.1         | 10.0                      |
| Fat                       | 2.5          | 2.1                       | 3.6          | 3.0                       | 3.3          | 3.0                       |
| Millseeds                 | 2.7          | 2.3                       | 2.3          | 1.9                       | 8.9          | 8.0                       |
| Minerals and vitamins     | 1.3          | 1.1                       | 2.4          | 2.0                       | 2.2          | 2.0                       |
| Molasses                  | 6.7          | 5.7                       | 8.3          | 7.0                       | 7.8          | 7.0                       |
| Total                     | 32.0         | 27.1                      | 28.5         | 23.9                      | 33.3         | 30.0                      |
| Total concentrates        | 100.0        | 84.7                      | 100.0        | 83.9                      | 100.0        | 90.0                      |
| <u>Hay or equivalent</u>  | --           | 15.3                      | --           | 16.1                      | --           | 10.0                      |
| Total ration              | --           | 100.0                     | --           | 100.0                     | --           | 100.0                     |

a/ The following data also were obtained as to weight gains and feed requirements:

| Year | Assumed weight gain |         | Feed inputs |                   |              |     |
|------|---------------------|---------|-------------|-------------------|--------------|-----|
|      | Total               | Per day | Per day     | per pound of gain |              |     |
|      |                     |         |             | Total             | Concentrates | Hay |
| 1963 | 400                 | --      | --          | 7.6               | 6.4          | 1.2 |
| 1975 | 500                 | 2.5     | 19.00       | 7.6               | 6.4          | 1.2 |

b/ Dashes indicate data are not relevant.

Source: 1963 rations are from John A. Hopkin and Robert Kramer, Cattle Feeding in California [1965].  
1973 and 1978 rations are from John Dunbar, Extension Animal Scientist, University of California, Davis.

Appendix Table B-3

Lightweight Feeder Rations: Estimated Percentage Composition,  
Statewide Average, 1963, 1973 and 1978<sup>a/</sup>

| Feed                                   | 1963               |                           | 1973         |                           | 1978         |                           |
|--|--------------------|---------------------------|--------------|---------------------------|--------------|---------------------------|
|  | Concentrates       | Concentrates and roughage | Concentrates | Concentrates and roughage | Concentrates | Concentrates and roughage |
| percent                                |                    |                           |              |                           |              |                           |
| <u>Grain</u>                           |                    |                           |              |                           |              |                           |
| Barley                                 | 36.4 <sub>b/</sub> | 13.3                      | 22.9         | 12.5                      | 21.9         | 12.0                      |
| Corn                                   | --                 | --                        | 16.5         | 9.0                       | 16.5         | 9.0                       |
| Grain sorghum                          | 36.6               | 13.4                      | 22.0         | 12.0                      | 21.9         | 12.0                      |
| Wheat                                  | --                 | --                        | 3.6          | 2.0                       | 3.7          | 2.0                       |
| Total                                  | 73.0               | 26.7                      | 65.0         | 35.5                      | 64.0         | 35.0                      |
| <u>Other concentrates</u>              |                    |                           |              |                           |              |                           |
| Cottonseed meal                        | 27.0               | 10.0                      | 9.0          | 5.0                       | --           | --                        |
| Other protein                          | --                 | --                        | --           | --                        | --           | --                        |
| Dried beet or citrus pulp              | --                 | --                        | 9.0          | 5.0                       | 9.0          | 5.0                       |
| Fat                                    | --                 | --                        | 3.6          | 2.0                       | 3.6          | 2.0                       |
| Millfeeds                              | --                 | --                        | --           | --                        | 9.0          | 5.0                       |
| Minerals and vitamins                  | --                 | --                        | 0.9          | 0.5                       | 1.8          | 1.0                       |
| Molasses                               | --                 | --                        | 12.5         | 7.0                       | 12.6         | 7.0                       |
| Total                                  | 27.0               | 10.0                      | 35.0         | 19.5                      | 36.0         | 20.0                      |
| Total concentrates                     | 100.0              | 36.7                      | 100.0        | 55.0                      | 100.0        | 55.0                      |
| <u>Roughage</u>                        |                    |                           |              |                           |              |                           |
| Hay                                    | --                 | 63.3                      | --           | 40.0                      | --           | 40.0                      |
| Straw, milo stalks or cottonseed hulls | --                 | --                        | --           | 5.0                       | --           | 5.0                       |
| Total                                  | --                 | 63.3                      | --           | 45.0                      | --           | 45.0                      |
| Total ration                           | --                 | 100.0                     | --           | 100.0                     | --           | 100.0                     |

a/ The following data also were obtained as to weight gains and feed requirements:

| Year | Animal weight |     | Weight gain |       | Feed inputs |                |
|------|---------------|-----|-------------|-------|-------------|----------------|
|      | in            | out | Total       | Daily | Daily       | per pound gain |
| 1963 | 400           | 600 | 200         | 1.33  | 15.0        | 11.3           |
| 1973 | 350           | 550 | 200         | 2.00  | 12.0        | 6.0            |
| 1978 | 350           | 550 | 200         | 2.15  | 12.5        | 5.8            |

b/ Dashes indicate that data are not relevant.

Sources: 1963 ration, Horace T. Strong and Reuben Albaugh, Animal Husbandmen.  
1973 and 1978 rations, John R. Dunbar, Extension Animal Scientist, University of California, Davis.

Appendix Table B-4

Feedlot Lamb Rations: Estimated Percentage Composition, Statewide Average, 1963 and 1973 a/

| Feed                     | 1963    | 1973  |
|--------------------------|---------|-------|
|                          | percent |       |
| <u>Grain</u>             |         |       |
| Barley                   | 60.0    | 64.6  |
| Corn                     | 16.6    | 18.5  |
| Grain sorghum            | 4.0     | 3.7   |
| Oats                     | 6.1     | 2.8   |
| Wheat                    |         |       |
| Total                    | 86.7    | 89.6  |
| <u>Other supplements</u> |         |       |
| Cottonseed meal          | 7.1     | 4.6   |
| Other protein            | .8      | .6    |
| Dried beet pulp          | 4.0     | 3.7   |
| Molasses                 | 1.4     | 1.5   |
| Other                    |         |       |
| Total                    | 13.3    | 10.4  |
| Total                    | 100.0   | 100.0 |

a/ Concentrates account for only a small proportion of the total feed consumed by sheep since the major source is pasture (see Table 8).

Source: G. M. Spurlock, Extension Animal Husbandman, University of California, Davis.

Appendix Table B-5  
 Swine Rations: Estimated Percentage  
 Composition, 1963 and 1973<sup>a/</sup>

| Feed                     | 1963             | 1973         |
|--------------------------|------------------|--------------|
|                          | Concentrates     | Concentrates |
|                          | percent          |              |
| <u>Grain</u>             |                  |              |
| Barley                   | 33.5             | 33.5         |
| Corn                     | 1.0              | 1.0          |
| Grain sorghum            | 50.0             | 50.0         |
| Wheat                    | -- <sup>b/</sup> | --           |
| Total                    | 84.5             | 84.5         |
| <u>Other supplements</u> |                  |              |
| Cottonseed meal          | 2.5              | 2.5          |
| Fish meal                | 1.0              | 1.0          |
| Meat scraps              | 2.5              | 2.5          |
| Soybean meal             | 5.0              | 5.0          |
| Alfalfa meal             | 3.0              | 3.0          |
| Dried beet pulp          | --               | --           |
| Millfeeds                | --               | --           |
| Minerals and<br>vitamins | 1.0              | 1.0          |
| Other                    | .5               | .5           |
| Total                    | 15.5             | 15.5         |
| Total                    | 100.0            | 100.0        |

a/ An estimate of the amount of feed to produce one pound of liveweight is estimated at 5.0 pounds in 1963 and 4.5 pounds in 1973.

b/ Dashes indicate minimal amounts of feed in typical rations.

Source: Information on rations was provided by the Animal Science Department, University of California, Davis: 1963 rations, Dr. Harold Hintz; 1973 rations, Dr. David Robinson.

Appendix Table B-6

Poultry Rations: Estimated Percentage Composition, Statewide Average,  
1963, 1973 and 1978

| Feed                     | Laying hens <sup>a/</sup> |       |                  | Broiler-Fryers     |       |       |                                 |        |
|--------------------------|---------------------------|-------|------------------|--------------------|-------|-------|---------------------------------|--------|
|                          | 1963                      | 1973  | 1978             | Meat <sup>b/</sup> |       |       | Eggs for Hatching <sup>c/</sup> |        |
|                          |                           |       |                  | 1963               | 1973  | 1978  | 1963                            | 1973   |
|                          | percent                   |       |                  |                    |       |       |                                 |        |
| <u>Grain</u>             |                           |       |                  |                    |       |       |                                 |        |
| Barley                   | 4.00                      | 4.0   | -- <sup>d/</sup> | --                 | --    | --    | 10.00                           | 10.0   |
| Corn                     | 16.00                     | 16.0  | 45.0             | 50.00              | 50.0  | 65.0  | 20.00                           | 20.0   |
| Grain sorghum            | 47.25                     | 47.5  | 20.0             | 12.50              | 12.5  | --    | 35.75                           | 36.0   |
| Oats                     | .50                       | --    | --               | --                 | --    | --    | 2.00                            | --     |
| Wheat                    | --                        | --    | 5.0              | --                 | --    | --    | --                              | --     |
| Total                    | 67.76                     | 67.5  | 70.0             | 62.50              | 62.5  | 65.0  | 67.75                           | 66.0   |
| <u>Other supplements</u> |                           |       |                  |                    |       |       |                                 |        |
| Cottonseed meal          | 3.00                      | 5.0   | 5.0              | 5.00               | 5.0   | --    | 2.50                            | 4.5    |
| Fish meal                | 3.70                      | 1.0   | --               | 5.00               | 3.0   | 3.0   | --                              | --     |
| Meat scraps and meal     | 6.50                      | 6.5   | 6.0              | 8.00               | 8.0   | 5.0   | 6.00                            | 6.0    |
| Soybean meal             | 3.00                      | 4.0   | 8.5              | 7.25               | 7.3   | 16.0  | 6.00                            | 6.0    |
| Alfalfa meal             | 5.00                      | 5.0   | 1.0              | 3.00               | 1.0   | --    | 5.00                            | 5.0    |
| Fat                      | 1.25                      | .5    | .5               | 3.00               | 7.0   | 4.0   | 1.25                            | 1.0    |
| Millfeeds                | 2.00                      | 2.5   | --               | --                 | --    | --    | 2.00                            | 2.0    |
| Minerals, vitamins       | 7.00                      | 7.0   | 7.0              | 2.25               | 2.2   | 1.5   | 7.00                            | 7.0    |
| Other                    | .80                       | 1.0   | 2.0              | 4.00               | 4.0   | 5.5   | 2.50                            | 2.5    |
| Total                    | 32.25                     | 32.5  | 30.0             | 37.50              | 37.5  | 35.0  | 32.25                           | 34.00  |
| Total                    | 100.00                    | 100.0 | 100.0            | 100.00             | 100.0 | 100.0 | 100.00                          | 100.00 |

a/ This ration includes sufficient feed for replacement pullets. The amount of feed per dozen eggs is estimated to 6.2 pounds.

b/ An estimate of the amount of feed per pound of dressed weight is as follows: 1963, 3.38 pounds; 1973, 2.16 pounds; and 1978, 2.16 pounds.

c/ An estimate of the amount of feed for the broiler breeding flock is 8.8 pounds per dozen during the laying season plus about 2.7 pounds per dozen eggs for raising the breeding flock.

d/ Dashes indicate that this feed generally is not an important ingredient in the ration.

Source: Information on rations was provided by Extension Poultry Specialists W. F. Rooney (1963) and F. C. Price (1973 and 1978), University of California.

Appendix Table B-7

Turkey Rations: Estimated Percentage Composition, Statewide Average,  
1963, 1973 and 1978

| Feed                     | Meat production <sup>a/</sup> |       |           | Egg production <sup>b/</sup> |       |       |
|--------------------------|-------------------------------|-------|-----------|------------------------------|-------|-------|
|                          | 1963                          | 1973  | 1978      | 1963                         | 1973  | 1978  |
|                          | percent                       |       |           |                              |       |       |
| <u>Grain</u>             |                               |       | <u>c/</u> |                              |       |       |
| Barley                   | 10.0                          | 10.0  | —         | 7.5                          | 8.0   | —     |
| Corn                     | 7.5                           | 7.5   | 40.0      | 7.5                          | 7.5   | 45.0  |
| Grain sorghum            | 46.0                          | 46.0  | 17.0      | 48.0                         | 50.0  | 20.0  |
| Oats                     | 1.0                           | 1.0   | —         | 1.0                          | 1.0   | —     |
| Wheat                    | —                             | —     | 5.0       | —                            | —     | 5.0   |
| Total                    | 64.5                          | 64.5  | 62.0      | 64.0                         | 66.5  | 70.0  |
| <u>Other supplements</u> |                               |       |           |                              |       |       |
| Cottonseed meal          | 5.0                           | 7.0   | 5.0       | 2.5                          | 3.0   | 3.0   |
| Fish meal                | 4.0                           | 1.0   | —         | 5.0                          | 1.0   | 1.0   |
| Meat scraps and meal     | 10.0                          | 5.0   | 7.0       | 7.5                          | 5.0   | 5.0   |
| Soybean meal             | 4.0                           | 6.0   | 18.0      | 7.5                          | 8.5   | 10.5  |
| Alfalfa meal             | 5.0                           | 5.0   | —         | 5.0                          | 5.0   | 1.0   |
| Fat                      | 1.0                           | 5.0   | 5.0       | 1.0                          | 2.5   | 2.5   |
| Millfeeds                | 3.0                           | 3.0   | —         | 1.5                          | 2.5   | —     |
| Minerals, vitamins       | 2.5                           | 2.5   | 2.0       | 5.0                          | 5.0   | 5.0   |
| Other                    | 1.0                           | 1.0   | 1.0       | 1.0                          | 1.0   | 2.0   |
| Total                    | 35.5                          | 35.5  | 38.0      | 36.0                         | 33.5  | 30.0  |
| Total                    | 100.0                         | 100.0 | 100.0     | 100.0                        | 100.0 | 100.0 |

<sup>a/</sup> Estimated pounds of feed per pound of dressed weight is as follows: 1963, 5 pounds; 1973, 3 pounds; and 1978, 3 pounds.

<sup>b/</sup> The additional feed required to maintain the breeding flock for egg production is estimated as follows: 1963, 2.5 pounds per egg; 1973, 2.0 pounds; and 1978, 2.0 pounds. The number of eggs per hen are estimated as follows: 1963, 71.5 eggs; 1973, 85 eggs; and 1978, 85 eggs.

<sup>c/</sup> Dashes indicate that the feed generally is not an important ingredient in the ration.

Source: Price Schroeder, Extension Poultry Specialist, University of California, Agricultural Extension Service, Parlier CA.

## APPENDIX C

## TABLES OF LIVESTOCK AND POULTRY STATISTICS, 1961-1978

Table C-1: Dairy Cattle: Average Number of Milk Cows and Milk Production, California, 1961-1978.

Table C-2: Beef Cattle: Number of Head on Farms, January 1, Inshipments, and Marketings from Feedlots, California, 1961-1978.

Table C-3: Beef Cattle: Commercial Slaughter and Estimated Sources of California-Produced Beef and Veal, 1961-1978.

Table C-4: Sheep: Number of Head on Farms, January 1, Shipments and Estimated Lambs Fed, California, 1961-1978.

Table C-5: Hogs: Pigs Saved, Inshipments, Numbers Slaughtered and Estimated Numbers Fed Out, California, 1961-1978.

Table C-6: Layers: Average Numbers, Egg Production and Use for Broiler Production, California, 1961-1978.

Table C-7: Eggs: Estimated Production, Trade, and Consumption, United States and California, 1961-1978.

Table C-8: Broilers and Fryers: Production and Consumption, United States and California, 1961-1978.

Table C-9: Turkeys: Production and Consumption, United States and California, 1961-1978.

Appendix Table C-1

Dairy Cattle: Average Number of Milk Cows  
and Milk Production, California, 1961-1978

| Year              | Average number<br>milk cows<br>(1,000 head) | Milk production<br>per cow<br>(pounds) | Total<br>production<br>(million pounds) |
|-------------------|---|--|---|
| 1961              | 813   | 10 100                                 | 8 211                                   |
| 1962              | 805   | 10 320                                 | 8 308                                   |
| 1963              | 798   | 10 400                                 | 8 299                                   |
| 1964              | 790   | 10 810                                 | 8 540                                   |
| 1965              | 783   | 10 830                                 | 8 480                                   |
| 1961-1965 average | 798   | 10 492                                 | 8 368                                   |
| 1966              | 774   | 11 112                                 | 8 601                                   |
| 1967              | 765   | 11 375                                 | 8 702                                   |
| 1968              | 754   | 11 869                                 | 8 949                                   |
| 1969              | 746   | 11 928                                 | 8 898                                   |
| 1970              | 755   | 12 526                                 | 9 457                                   |
| 1966-1970 average | 759   | 11 762                                 | 8 921                                   |
| 1971              | 763   | 12 726                                 | 9 710                                   |
| 1972              | 778   | 13 368                                 | 10 400                                  |
| 1973              | 792   | 13 045                                 | 10 332                                  |
| 1974              | 797   | 13 295                                 | 10 596                                  |
| 1975              | 800   | 13 566                                 | 10 853                                  |
| 1971-1975 average | 786   | 13 200                                 | 10 378                                  |
| 1976              | 811   | 14 282                                 | 11 583                                  |
| 1977              | 827   | 14 462                                 | 11 960                                  |
| 1978              | 846   | 14 027                                 | 11 867                                  |

Source: California Crop and Livestock Reporting Service (1979)  
(California Livestock Statistics, 1978).



Appendix Table C-2

Beef Cattle: Number of Head on Farms, January 1, Inshipments and Marketings  
from Feedlots, California, 1961-1978

| Year              | January 1 numbers |                        |                     |              |         |                      |                      | Shipments  |   |   | Marketings                            |
|-------------------|-------------------|------------------------|---------------------|--------------|---------|----------------------|----------------------|--|---|---|---------------------------------------|
|                   | Beef cows         |                        | Heifers             |              | Calves  |                      | Bulls<br>1 year<br>+ | Stockers<br>and feeders<br>shipped<br>into<br>California | Cattle and<br>calves<br>shipped<br>out of<br>California | Cattle<br>inshipped for<br>immediate<br>slaughter | Cattle and<br>calves from<br>feedlots |
|                   | 2 years<br>+      | That<br>have<br>calved | 1-2<br>years<br>old | Replacements | Heifers | Steer<br>and<br>bull |                      |  |   |   |                                       |
|                   | 1,000 head        |                        |                     |              |         |                      |                      |  |   |   |                                       |
| 1961              | 851               | a/                     | 314                 | -            | 269     | 389                  | 65                   | 1,454  | 148   | 375   | 1,701                                 |
| 1962              | 858               | -                      | 273                 | -            | 296     | 430                  | 66                   | 1,829  | 206   | 458   | 1,844                                 |
| 1963              | 854               | -                      | 314                 | -            | 291     | 514                  | 68                   | 1,749  | 232   | 492   | 1,899                                 |
| 1964              | 927               | -                      | 299                 | -            | 309     | 527                  | 71                   | 1,539  | 196   | 544   | 2,061                                 |
| 1965              | 956               | -                      | 339                 | -            | 336     | 503                  | 74                   | 1,984  | 213   | 528   | 2,282                                 |
| 1961-1965 average | 889               | -                      | 308                 | -            | 300     | 473                  | 69                   | 1,711  | 199   | 479   | 1,957                                 |
| 1966              | 1004              | -                      | 334                 | -            | 360     | 517                  | 80                   | 1,902  | 223   | 494   | 2,219                                 |
| 1967              | 1035              | -                      | 344                 | -            | 324     | 522                  | 78                   | 1,863  | 265   | 589   | 2,049                                 |
| 1968              | 1004              | -                      | 341                 | -            | 351     | 548                  | 76                   | 1,870  | 325   | 542   | 2,068                                 |
| 1969              | 995               | -                      | 345                 | -            | 346     | 588                  | 77                   | 1,851  | 336   | 614   | 2,057                                 |
| 1970              | 946               | 894                    | 348                 | 203          | 341     | 632                  | 70                   | 1,728  | 435   | 537   | 1,966                                 |
| 1966-1970 average | 997               | -                      | 342                 | -            | 344     | 561                  | 76                   | 1,843  | 317   | 555   | 2,072                                 |
| 1971              | -                 | 916                    | -                   | 208          | -       | -                    | -                    | 1,803  | 404   | 587   | 1,990                                 |
| 1972              | -                 | 906                    | -                   | 212          | -       | -                    | -                    | 1,901  | 478   | 455   | 2,062                                 |
| 1973              | -                 | 915                    | -                   | 211          | -       | -                    | -                    | 1,823  | 463   | 454   | 1,942                                 |
| 1974              | -                 | 1054                   | -                   | 252          | -       | -                    | -                    | 1,465  | 436   | 377   | 2,002                                 |
| 1975              | -                 | 1097                   | -                   | 286          | -       | -                    | -                    | 1,809  | 353   | 429   | 1,650                                 |
| 1971-1975 average | -                 | 978                    | -                   | 234          | -       | -                    | -                    | 1,760  | 427   | 460   | 1,929                                 |
| 1976              | -                 | 1010                   | -                   | 240          | -       | -                    | -                    | 1,323  | 470   | 406   | 1,844                                 |
| 1977              | -                 | 991                    | -                   | 210          | -       | -                    | -                    | 1,381  | 343   | 341   | 1,612                                 |
| 1978              | -                 | 966                    | -                   | 190          | -       | -                    | -                    | 1,915  | 467   | 323   | 1,415                                 |

a/ Dashes indicate data not available

Source: California Crop and Livestock Reporting Service, California Livestock Statistics, 1978, (various issues), Sacramento (processed).

Appendix Table C-3

Beef Cattle: Commercial Slaughter and Estimated Sources of California-Produced  
Beef and Veal, 1961-1978

| Year              | Commercial slaughter |        |                |        |       | Estimated sources of California-produced meat              |  |                                   |
|-------------------|----------------------|--------|----------------|--------|-------|--|--|-----------------------------------|
|                   | Number               |        | Carcass weight |        |       | Inshipments<br>for<br>immediate<br>slaughter <sup>a/</sup> | Marketings<br>from<br>feedlots <sup>a/</sup> | Other<br>(residual) <sup>b/</sup> |
|                   | Cattle               | Calves | Cattle         | Calves | Total |  |  |                                   |
|                   | thousand head        |        | million pounds |        |       |  |  |                                   |
| 1961              | 2514                 | 443    | 1502           | 62     | 1564  | <sup>c/</sup>  | -  | -                                 |
| 1962              | 2565                 | 364    | 1525           | 49     | 1574  | -  | -  | -                                 |
| 1963              | 2680                 | 292    | 1607           | 43     | 1650  | -  | -  | -                                 |
| 1964              | 2957                 | 348    | 1769           | 48     | 1817  | -  | -  | -                                 |
| 1965              | 3004                 | 387    | 1779           | 55     | 1834  | -  | -  | -                                 |
| 1961-1965 average | 2744                 | 367    | 1636           | 51     | 1688  | 286  | 1166   | 236                               |
| 1966              | 3121                 | 337    | 1865           | 51     | 1916  | -  | -  | -                                 |
| 1967              | 3050                 | 287    | 1839           | 47     | 1886  | -  | -  | -                                 |
| 1968              | 2919                 | 256    | 1756           | 50     | 1806  | -  | -  | -                                 |
| 1969              | 2936                 | 235    | 1765           | 48     | 1813  | -  | -  | -                                 |
| 1970              | 2849                 | 189    | 1742           | 39     | 1781  | -  | -  | -                                 |
| 1966-1970 average | 2975                 | 261    | 1793           | 47     | 1840  | 335  | 1249   | 256                               |
| 1971              | 2854                 | 153    | 1733           | 31     | 1764  | -  | -  | -                                 |
| 1972              | 2761                 | 119    | 1678           | 27     | 1705  | -  | -  | -                                 |
| 1973              | 2670                 | 75     | 1633           | 20     | 1653  | -  | -  | -                                 |
| 1974              | 2942                 | 130    | 1830           | 33     | 1863  | -  | -  | -                                 |
| 1975              | 2892                 | 334    | 1788           | 80     | 1868  | -  | -  | -                                 |
| 1971-1975 average | 2824                 | 162    | 1732           | 38     | 1770  | 283  | 1184   | 303                               |
| 1976              | 2855                 | 356    | 1769           | 83     | 1852  | 252  | 1143   | 457                               |
| 1977              | 2621                 | 362    | 1619           | 32     | 1651  | -  | -  | -                                 |
| 1978              | 2292                 | 257    | 1424           | 29     | 1453  | -  | -  | -                                 |

<sup>a/</sup> Estimated by multiplying numbers (see Appendix Table C-2) by average carcass weight for cattle which is as follows: 1961-1965, 596 pounds; 1966-1970, 603 pounds; 1971-1975, 614 pounds; 1976, 620 pounds.

<sup>b/</sup> Total commercial slaughter less estimated quantities from inshipments and marketings. Includes veal and meat produced from cull animals.

<sup>c/</sup> Dashes indicate data not calculated for individual years.

Source: California Crop and Livestock Reporting Service (1979) Annual Livestock Slaughter, 1978 (various issues), Sacramento (processed).

Appendix Table C-4

Sheep: Number of Head on Farms, January 1, Shipments, and Estimated  
Lambs Fed, California, 1961-1978

| Year              | Ewes 1 yr<br>and older<br>January 1 | Wethers and<br>rams 1 yr<br>and older<br>January 1 | Lambs<br>docked | Lambs<br>weaned <sup>a/</sup> | Sheep and<br>lambs shipped<br>out (rail) | Stocker and<br>feeder<br>inshipments | Total lambs and<br>replacement to<br>feed in<br>California <sup>b/</sup> | Replacements <sup>c/</sup> | Lambs fed<br>total <sup>d/</sup> |
|-------------------|-------------------------------------|--|-----------------|-------------------------------|--|--------------------------------------|--|----------------------------|----------------------------------|
|                   | 1000 head                           |  |                 |                               |  |                                      |  |                            |                                  |
| 1961              | 1388                                | 53   | 1263            | 1137                          | 148                                      | 616                                  | 1605   | 278                        | 1327                             |
| 1962              | 1388                                | 52   | 1263            | 1137                          | 192                                      | 508                                  | 1453   | 278                        | 1175                             |
| 1963              | 1263                                | 47   | 1162            | 1046                          | 139                                      | 415                                  | 1322   | 253                        | 1069                             |
| 1964              | 1238                                | 47   | 1139            | 1025                          | 119                                      | 478                                  | 1384   | 248                        | 1136                             |
| 1965              | 1188                                | 45   | 1081            | 973                           | 52                                       | 396                                  | 1315   | 238                        | 1079                             |
| 1961-1965 average | 1293                                | 49   | 1181            | 1064                          | 130                                      | 483                                  | 1416   | 259                        | 1157                             |
| 1966              | 1188                                | <sup>e/</sup>                                      | 1081            | 973                           | 68                                       | 379                                  | 1284   | 238                        | 1046                             |
| 1967              | 1216                                | -  | 1111            | 1000                          | 33                                       | 287                                  | 1254   | 243                        | 1011                             |
| 1968              | 1155                                | 44   | 1051            | 946                           | 16                                       | 297                                  | 1227   | 231                        | 996                              |
| 1969              | 1074                                | 41   | 967             | 870                           | 10                                       | 294                                  | 1154   | 215                        | 939                              |
| 1970              | 1024                                | 37   | 932             | 839                           | 15                                       | 266                                  | 1090   | 205                        | 885                              |
| 1966-1970 average | 1131                                | -  | 1028            | 926                           | 28                                       | 305                                  | 1203   | 226                        | 977                              |
| 1971              | 992                                 | 33   | 913             | 822                           | 4  | 197                                  | 1015   | 198                        | 817                              |
| 1972              | 935                                 | 32   | 935             | 774                           | -  | 204                                  | 978  | 187                        | 791                              |
| 1973              | 892                                 | 26   | 838             | 754                           | -  | 236                                  | 990  | 178                        | 812                              |
| 1974              | 909                                 | 34   | 809             | 728                           | -  | 162                                  | 890  | 182                        | 708                              |
| 1975              | 878                                 | 25   | 799             | 719                           | -  | 185                                  | 904  | 176                        | 728                              |
| 1971-1975 average | 921                                 | 30   | 844             | 759                           | -  | 197                                  | 955  | 184                        | 771                              |
| 1976              | 811                                 | 29   | 738             | 664                           | -  | 233                                  | 897  | 162                        | 735                              |
| 1977              | 770                                 | 27   | 700             | 630                           | -  | 294                                  | 924  | 154                        | 770                              |
| 1978              | 780                                 | 27   | 694             | -                             | -  | 266                                  | -  | -                          | -                                |
| 1979              | 838                                 | 26   | -               | -                             | -  | -                                    | -  | -                          | -                                |

<sup>a/</sup> Derived = 90 percent of lambs docked.

<sup>b/</sup> Derived = Lambs weaned - sheep and lambs shipped out + stocker and feeder inshipments.

<sup>c/</sup> Derived = 20 percent of ewes 1 year and older.

<sup>d/</sup> Derived = Total lambs and replacements to feed in California - replacements.

<sup>e/</sup> Dashes indicate data are not available.

Source: California Crop and Livestock Reporting Service, California Livestock Statistics (1979)(various issues), Sacramento (processed).

Appendix Table C-5

Hogs: Pigs Saved, Inshipments, Numbers Slaughtered,  
and Estimated Numbers Fed Out, California, 1961-1978

| Year              | Pigs saved | Number                     | Number                       | Implied number                         |
|-------------------|------------|----------------------------|------------------------------|--|
|                   |            | shipped into<br>California | slaughtered<br>in California | fed out in<br>California <sup>a/</sup> |
| 1000 head         |            |                            |                              |  |
| 1961              | 404        | 1303                       | 1622                         | 319                                    |
| 1962              | 361        | 1495                       | 1757                         | 262                                    |
| 1963              | 292        | 1445                       | 1628                         | 183                                    |
| 1964              | 238        | 1559                       | 1730                         | 171                                    |
| 1965              | 247        | 1418                       | 1593                         | 175                                    |
| 1961-1965 average | 308        | 1444                       | 1666                         | 222                                    |
| 1966              | 264        | 1361                       | 1520                         | 159                                    |
| 1967              | 260        | 1488                       | 1650                         | 162                                    |
| 1968              | 209        | 1502                       | 1628                         | 126                                    |
| 1969              | 195        | 1418                       | 1549                         | 131                                    |
| 1970              | 222        | 1450                       | 1596                         | 146                                    |
| 1966-1970 average | 230        | 1444                       | 1589                         | 145                                    |
| 1971              | 225        | 1428                       | 1566                         | 138                                    |
| 1972              | 245        | 1270                       | 1503                         | 233                                    |
| 1973              | 210        | 1132                       | 1265                         | 133                                    |
| 1974              | 174        | 1361                       | 1486                         | 125                                    |
| 1975              | 203        | 2396                       | 1453                         | 157                                    |
| 1971-1975 average | 211        | 1297                       | 1455                         | 158                                    |
| 1976              | 206        | 1393                       | 1555                         | 162                                    |
| 1977              | 230        | 1300                       | 1535                         | 235                                    |
| 1978              | 284        | 1337                       | 1629                         | 292                                    |

<sup>a/</sup> Derived as difference between number slaughtered and number shipped into California.

Source: California Crop and Livestock Reporting Service, California Livestock Statistics (1979) (various issues), Sacramento (processed).

Appendix Table C-6

Layers: Average Numbers, Egg Production, and Estimated Use for  
Broiler Production, California, 1961-1978

| Year              | Average number<br>of layers | Eggs<br>per bird | Total egg<br>production | Estimated use for<br>broiler production |                      | Chicks hatched |                 |
|-------------------|-----------------------------|------------------|-------------------------|---|----------------------|----------------|-----------------|
|                   |                             |                  |                         | Eggs <sup>a/</sup>                      | Layers <sup>b/</sup> | Egg type       | Broiler<br>type |
|                   |                             |                  |                         | million                                 | thousand             | million        | million         |
| 1961              | 27 270                      | 224              | 6 105                   | 78                                      | 433                  | 65             | 66              |
| 1962              | 29 376                      | 224              | 6 581                   | 80                                      | 444                  | 67             | 68              |
| 1963              | 30 198                      | 225              | 6 788                   | 75                                      | 417                  | 65             | 64              |
| 1964              | 32 409                      | 225              | 7 304                   | 73                                      | 406                  | 67             | 62              |
| 1965              | 32 599                      | 227              | 7 406                   | 79                                      | 439                  | 60             | 67              |
| 1961-1965 average | 30 370                      | 225              | 6 837                   | 77                                      | 427                  | 65             | 65              |
| 1966              | 34 231                      | 224              | 7 663                   | 88                                      | 489                  | 69             | 75              |
| 1967              | 36 679                      | 220              | 8 081                   | 87                                      | 483                  | 66             | 74              |
| 1968              | 38 037                      | 219              | 8 332                   | 88                                      | 489                  | 64             | 75              |
| 1969              | 38 539                      | 222              | 8 557                   | 100                                     | 556                  | 65             | 85              |
| 1970              | 40 060                      | 216              | 8 657                   | 113                                     | 628                  | 73             | 96              |
| 1966-1970 average | 37 509                      | 220              | 8 258                   | 95                                      | 528                  | 67             | 81              |
| 1971              | 41 552                      | 217              | 9 012                   | 112                                     | 622                  | 62             | 95              |
| 1972              | 39 201                      | 221              | 8 652                   | 107                                     | 594                  | 58             | 91              |
| 1973              | 35 147                      | 219              | 7 680                   | 106                                     | 589                  | 60             | 90              |
| 1974              | 38 276                      | 222              | 8 485                   | 113                                     | 628                  | 47             | 96              |
| 1975              | 37 940                      | 223              | 8 467                   | 122                                     | 678                  | 44             | 104             |
| 1971-1975 average | 38 423                      | 220              | 8 459                   | 112                                     | 622                  | 54             | 95              |
| 1976              | 37 557                      | 230              | 8 635                   | 133                                     | 739                  | 46             | 113             |
| 1977              | 36 469                      | 229              | 8 345                   | 141                                     | 783                  | 50             | 120             |
| 1978              | 35 767                      | 235              | 8 412                   | 154                                     | 856                  | 51             | 131             |

a/ Derived = Broiler chicks hatched + 85 percent (estimated percent hatched).

b/ Derived by taking estimated eggs for broiler production divided by estimated number of eggs per layer for hatching of 180 eggs.

Source: California Crop and Livestock Reporting Service (1979), Production and Marketing Eggs, Chickens and Turkeys, California - 1978, Sacramento.

Appendix Table C-7

Eggs: Estimated Production, Trade and Consumption, United States and California, 1961-1978

| Year              | Total egg production | Eggs used for chicks hatched <sup>a/</sup> | Shipments into and out of California |   | Estimated net outshipments as a percentage of total production | Estimated eggs available for consumption <sup>b/</sup> | California population July 1 | Apparent California consumption per capita | U.S. consumption per capita |
|-------------------|----------------------|--|--------------------------------------|---|--|--|------------------------------|--|-----------------------------|
|                   |                      |  | Rail/truck into California           | Outshipments through Arizona boarder stations |  |  |                              |  |                             |
|                   | million              |  | million                              |   | percent  | million  |                              |  |                             |
| 1961              | 6 105                | 154  | 57                                   | - <sup>c/</sup>                               | -  | -  | 16.4                         | -  | 329                         |
| 1962              | 6 581                | 159  | 50                                   | -   | -  | -  | 16.9                         | -  | 327                         |
| 1963              | 6 788                | 152  | 24                                   | -   | -  | -  | 17.5                         | -  | 318                         |
| 1964              | 7 304                | 152  | 36                                   | -   | -  | -  | 18.0                         | -  | 318                         |
| 1965              | 7 406                | 149  | 10                                   | -   | -  | -  | 18.5                         | -  | 314                         |
| 1961-1965 average | 6 837                | 153  | 35                                   | 360   | 4.9  | 6 356  | 17.5                         | 363  | 321                         |
| 1966              | 7 663                | 169  | 20                                   | 426   | -  | -  | 18.8                         | -  | 313                         |
| 1967              | 8 081                | 165  | 23                                   | 469   | -  | -  | 19.2                         | -  | 320                         |
| 1968              | 8 332                | 164  | -                                    | 410   | -  | -  | 19.5                         | -  | 316                         |
| 1969              | 8 557                | 176  | -                                    | 757   | -  | -  | 19.8                         | -  | 310                         |
| 1970              | 8 657                | 199  | -                                    | 822   | -  | -  | 20.0                         | -  | 311                         |
| 1965-1970 average | 8 258                | 175  | -                                    | 577   | 7.1  | 7 509  | 19.5                         | 385  | 314                         |
| 1971              | 9 012                | 185  | -                                    | -   | -  | -  | 20.3                         | -  | 314                         |
| 1972              | 8 652                | 175  | -                                    | 682   | 8.0  | -  | 20.5                         | -  | 308                         |
| 1973              | 7 680                | 176  | -                                    | 595   | 7.9  | -  | 20.7                         | -  | 294                         |
| 1974              | 8 485                | 168  | -                                    | 610   | 7.3  | -  | 20.9                         | -  | 283                         |
| 1975              | 8 467                | 174  | -                                    | -   | -  | -  | 21.1                         | -  | 279                         |
| 1971-1975 average | 8 459                | 175  | -                                    | -   | 7.5  | 7 663  | 20.7                         | 370  | 297                         |
| 1976              | 8 635                | 187  | -                                    | -   | -  | -  | 21.5                         | -  | 276                         |
| 1977              | 8 345                | 200  | -                                    | -   | -  | -  | 21.9                         | -  | -                           |
| 1978              | 8 412                | 214  | -                                    | -   | -  | -  | 22.3                         | -  | -                           |

a/ Derived from chicks hatched (Appendix Table C-6) divided by estimated percentage hatched (85 percent).

b/ Production less eggs for hatching adjusted for trade.

c/ Dashes indicate data not available.

Sources: Egg production and outshipments: California Crop and Livestock Reporting Service, 1979, Production and Marketing Eggs, Chickens and Turkeys, California - 1978, Sacramento. Rail and trade inshipments: California Crop and Livestock Reporting Service, California Egg and Poultry Summary - 1972, Sacramento (not reported since 1972). Population: California Department of Finance (1978), Provisional Projections of California Counties to 2000. U.S. Consumption: U.S. Economics Statistical and Cooperative Service, Food Consumption, Prices & Expenditures, Supplement for 1976 to Agricultural Economics Report No. 138, Washington, 1978.

Appendix Table C-8

## Broilers and Fryers: Production and Consumption, United States and California, 1961-1978

| Year              | California                   |                           |                             | Total United States production liveweight | Ratio: California to United States production percent | United States chicken consumption per capita (RTC basis) pounds | Ratio of commercial broilers to all chickens for United States percent | Truck receipts of fryers to San Francisco and Los Angeles markets (RTC basis) <sup>a/</sup> mil. lbs. | California Production (RTC basis) <sup>a/</sup> mil. lbs. | Apparent California consumption per capita (RTC basis) <sup>b/</sup> pounds |
|-------------------|------------------------------|---------------------------|-----------------------------|---|---|---|--|---|---|---|
|                   | Broilers and fryers produced | Average weight liveweight | Total production liveweight |   |   |   |  |   |   |   |
|                   | 1000 birds                   | pounds                    | mil. lbs.                   |   |   |   |  |   |   |   |
| 1961              | 62 673                       | 3.6                       | 226                         | 6 832                                     | 3.3   | 29.9  | 85.0   | 210   | 162   | - <sup>c/</sup>   |
| 1962              | 60 400                       | 3.6                       | 217                         | 6 907                                     | 3.2   | 29.9  | 85.4   | 191   | 157   | -   |
| 1963              | 60 650                       | 3.7                       | 224                         | 7 276                                     | 3.1   | 30.8  | 86.6   | 201   | 162   | -   |
| 1964              | 57 002                       | 3.7                       | 211                         | 7 521                                     | 2.8   | 31.2  | 87.0   | 222   | 152   | -   |
| 1965              | 59 852                       | 3.8                       | 227                         | 8 111                                     | 2.8   | 33.4  | 87.9   | 228   | 164   | -   |
| 1961-1965 average | 60 115                       | 3.7                       | 221                         | 7 329                                     | 3.0   | 31.0  | 86.4   | 212   | 159   | 21.2  |
| 1966              | 67 034                       | 3.7                       | 248                         | 8 989                                     | 2.8   | 35.6  | 88.6   | 250   | 178   | -   |
| 1967              | 69 045                       | 3.9                       | 269                         | 9 183                                     | 2.9   | 36.5  | 87.9   | 280   | 194   | -   |
| 1968              | 67 664                       | 3.8                       | 257                         | 9 326                                     | 2.8   | 36.7  | 88.6   | 308   | 185   | -   |
| 1969              | 76 757                       | 3.8                       | 292                         | 10 048                                    | 2.9   | 38.4  | 89.8   | 331   | 210   | -   |
| 1970              | 85 927                       | 3.9                       | 335                         | 10 819                                    | 3.1   | 40.5  | 90.0   | 347   | 241   | -   |
| 1966-1970 average | 73 285                       | 3.8                       | 280                         | 9 673                                     | 2.9   | 37.5  | 89.0   | 303   | 202   | 25.9  |
| 1971              | 89 233                       | 4.0                       | 357                         | 10 818                                    | 3.3   | 40.4  | 90.8   | 351   | 257   | -   |
| 1972              | 86 022                       | 4.2                       | 361                         | 11 480                                    | 3.2   | 42.0  | 91.7   | 356   | 260   | -   |
| 1973              | 83 193                       | 4.1                       | 341                         | 11 220                                    | 3.0   | 40.7  | 91.7   | 335   | 246   | -   |
| 1974              | 90 377                       | 4.2                       | 380                         | 11 320                                    | 3.4   | 41.1  | 91.1   | 351   | 273   | -   |
| 1975              | 95 825                       | 4.3                       | 412                         | 11 096                                    | 3.7   | 40.3  | 92.1   | 325   | 311   | -   |
| 1971-1975 average | 88 930                       | 4.2                       | 370                         | 11 174                                    | 3.3   | 40.9  | 91.5   | 344   | 269   | 29.6  |
| 1976              | 104 950                      | 4.3                       | 451                         | 12 517                                    | 3.6   | 43.3  | 93.0   | 340   | 325   | 31.5  |
| 1977              | 112 500                      | 4.4                       | 495                         | 12 992                                    | 3.8   | - <sup>d/</sup>   | 93.0   | 320   | 356   | 30.9  |
| 1978              | 122 400                      | 4.7                       | 575                         | 13 662                                    | 4.2   | -   | -  | 318   | 414   | 32.8  |

a/ Derived by multiplying production by the ready-to-cook conversion factor (72 percent).

b/ Derived = California production plus truck receipts divided by California population (see Appendix Table C-7).

c/ Not calculated for individual years.

d/ Dashes indicate data were not available when the report was prepared.

Sources: California production and truck receipts: California Crops and Livestock Reporting Service, Production and Marketing Eggs, Chickens and Turkeys, California - 1978, Sacramento. United States production: U.S. Department of Agriculture, Agricultural Statistics-1977, Washington. United States consumption: U.S. Economics, Statistics & Cooperatives Service, Food Consumption, Prices and Expenditures, Supplement for 1976 to Agricultural Economics Report No. 138, Washington, 1978.

Appendix Table C-9

Turkeys: Production and Consumption, United States and California, 1961-1978

| Year              | California                       |   |                             | Estimated California production (RTC basis) <sup>b/</sup> | Total United States production (RTC basis) | Ratio California to United States production (RTC Basis) | United States consumption (per capita RTC) | California breeder hens January 1 | Number raised per breeder hen <sup>c/</sup> |
|-------------------|----------------------------------|---|-----------------------------|---|--|--|--|-----------------------------------|---|
|                   | Turkeys raised (heavy and light) | Average weight liveweight <sup>a/</sup> | Total production liveweight |   |  |  |  |                                   |   |
|                   | 1000 birds                       | pounds                                  | mil. lbs.                   |   |  |  |  |                                   |   |
| 1961              | 17 765                           | 19.2                                    | 341 668                     | 273   | 1 495                                      | 18.3   | 7.4  | 1 133                             | 15.7  |
| 1962              | 17 963                           | 19.4                                    | 348 686                     | 279   | 1 294                                      | 21.6   | 7.0  | 1 022                             | 17.6  |
| 1963              | 15 082                           | 19.3                                    | 291 301                     | 233   | 1 351                                      | 17.2   | 6.8  | 965                               | 15.6  |
| 1964              | 15 773                           | 19.3                                    | 304 561                     | 244   | 1 453                                      | 16.8   | 7.4  | 843                               | 18.7  |
| 1965              | 15 667                           | 19.1                                    | 299 866                     | 240   | 1 515                                      | 15.8   | 7.4  | 840                               | 18.6  |
| 1961-1965 average | 16 450                           | 19.3                                    | 317 216                     | 254   | 1 422                                      | 17.9   | 7.2  | 961                               | 17.1  |
| 1966              | 16 972                           | 19.5                                    | 331 509                     | 265   | 1 674                                      | 15.8   | 7.8  | 915                               | 18.5  |
| 1967              | 19 111                           | 19.8                                    | 378 710                     | 303   | 1 870                                      | 16.2   | 8.6  | 987                               | 19.4  |
| 1968              | 14 353                           | 19.7                                    | 283 373                     | 227   | 1 611                                      | 14.1   | 7.9  | 740                               | 19.4  |
| 1969              | 14 994                           | 20.3                                    | 304 589                     | 244   | 1 606                                      | 16.2   | 8.3  | 673                               | 22.3  |
| 1970              | 15 585                           | 19.5                                    | 303 908                     | 243   | 1 732                                      | 14.0   | 8.0  | 720                               | 21.6  |
| 1966-1970 average | 16 203                           | 19.8                                    | 320 418                     | 256   | 1 699                                      | 15.1   | 8.1  | 807                               | 20.1  |
| 1971              | 16 801                           | 19.1                                    | 320 899                     | 257   | 1 779                                      | 14.4   | 8.4  | 720 <sup>d/</sup>                 | 23.3  |
| 1972              | 17 636                           | 19.0                                    | 335 084                     | 268   | 1 915                                      | 14.0   | 9.0  | 771                               | 22.9  |
| 1973              | 17 584                           | 18.4                                    | 322 883                     | 258   | 1 933                                      | 13.3   | 8.5  | 802                               | 21.9  |
| 1974              | 17 888                           | 18.0                                    | 321 984                     | 258   | 1 911                                      | 13.5   | 8.9  | 895                               | 20.0  |
| 1975              | 15 771                           | 19.0                                    | 299 649                     | 240   | 1 804                                      | 13.3   | 8.6  | 716                               | 22.0  |
| 1971-1975 average | 17 136                           | 18.7                                    | 320 099                     | 256   | 1 868                                      | 13.7   | 8.7  | 781                               | 21.9  |
| 1976              | 17 514                           | 19.0 <sup>e/</sup>                      | 332 614                     | 266   | 2 059                                      | 12.6   | 9.2  | 700                               | 25.0  |
| 1977              | 17 365                           | -                                       | 344 880                     | -   | 2 012                                      | -  | 9.2  | 560                               | -   |
| 1978              | 16 780                           | -                                       | -                           | -   | -  | -  | -  | 500                               | -   |

<sup>a/</sup> Derived: production divided by turkeys raised (heavy and light).<sup>b/</sup> Derived by multiplying production by the ready-to-cook conversion factor (80 percent).<sup>c/</sup> Derived by dividing numbers raised by numbers of breeder hens.<sup>d/</sup> Data for 1971 and subsequent years (refer to December 1 of previous year).<sup>e/</sup> Dashes indicate data were not available when the report was prepared.Sources: California turkeys raised and number of breeder hens: California Crop and Livestock Reporting Service, Production and Marketing Eggs, Chickens and Turkeys, California-1978, Sacramento. United States and California production: U.S. Department of Agriculture, Agricultural Statistics (various years), Washington. United States Consumption: U.S. Economics, Statistics & Cooperatives Service, Food Consumption, Prices and Expenditures, Supplement for 1976 to Agricultural Economics Report No. 138, Washington.



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