



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

GIANNINI FOUNDATION OF  
AGRICULTURE ECONOMICS

FEB

WITHDRAWN  
1972

Proceedings of  
**THE NATIONAL AGRICULTURAL MARKETING CONFERENCE**

Denver, Colorado

April 27-29, 1971

**Sponsored by:**

**Consumer and Marketing Service, USDA  
USDA and State Extension Services  
Experiment Station Committee on Organization and Policy  
Foreign Agricultural Service, USDA  
National Association of Marketing Officials  
National Association of State Departments of Agriculture  
USDA and Cooperative USDA-State Research Service**

Proceedings of  
THE NATIONAL AGRICULTURAL MARKETING CONFERENCE

Denver, Colorado

April 27-29, 1971

Sponsored by:

Consumer and Marketing Service, USDA  
USDA and State Extension Services  
Experiment Station Committee on Organization and Policy  
Foreign Agricultural Service, USDA  
National Association of Marketing Officials  
National Association of State Departments of Agriculture  
USDA and Cooperative USDA-State Research Service

FOREWARD

The sponsoring agencies and the Program Committee express their appreciation to the speakers; the individuals who served as Steering Committee--Discussion Leaders for the various work groups; the Secretary-Consultants; and to those individuals who served as Chairmen of the various sessions. The smooth functioning of the Conference was due to work of many groups and individuals but particularly to the Colorado Department of Agriculture, the Colorado Extension Service, and the Colorado Experiment Station.

Copies of these proceedings may be obtained from the Matching Fund Program Staff, Consumer and Marketing Service, USDA, Washington, D. C. 20250.

## Contents

|   | <u>Page</u> |
|---|-------------|
| Plans for Workshop..... George H. Goldsborough  | 1           |
| Responsibilities of Public Agencies to the<br>Changing Food and Fiber Industry..... J. Phil Campbell ✓  | 3           |
| Industrialization in Agriculture .....Eric Thor ✓   | 13          |
| Alternative Marketing Systems of the Future.....William E. Black ✓                                      | 26          |
| Implications to Markets and Marketing of:   |             |
| 1. New and Improved Natural and Synthetic Food<br>and Fiber Products.....F. E. Horan ✓                  | 31          |
| 2. Innovations in Agricultural Production and<br>Harvesting.....LaVon Fife ✓                            | 55          |
| 3. Innovations in Food Processing and<br>Distribution.....Richard J. Jones ✓                            | 62          |
| 4. Electronic Data Processing.....Charles French ✓  | 69          |
| Summaries of Workgroup Discussions.....   | 78          |
| Problems, Policies and Prospects for U. S. Foreign<br>Trade.....Kenneth K. Krogh ✓                      | 81          |
| Export Prospects by Commodity   |             |
| 1. Fats and Oils, Oilseed and Oil Cake.....Howard A. Akers ✓  | 90          |
| 2. Tobacco.....H. Reiter Webb ✓   | 92          |
| 3. Cotton.....H. Reiter Webb ✓  | 93          |
| 4. Poultry.....David R. Strobel ✓   | 94          |
| 5. Horticultural Commodities.....John W. Stewart ✓  | 95          |
| 6. Dairy Products.....Samuel L. Crockett ✓  | 97          |
| 7. Grains.....Richard E. Bell ✓   | 98          |
| Ascertaining Consumer Preference and Market<br>Potential for Selected Products.....Peter L. Henderson ✓ | 101         |
| Foreign Market Techniques.....A. B. Brannock ✓  | 106         |
| Transportation Developments and Their Implications<br>to Foreign Trade.....Dale Anderson ✓              | 110         |
| Summaries of Workgroup Discussions.....   | 115         |
| F.T.C. Views of Consumer Concerns Regarding Food<br>and the Food Industry.....Jeannette M. Lynch ✓      | 122         |
| Regulating and Serving the Domestic Market.....Clayton Yeutter ✓  | 130         |
| Summaries of Workgroup Discussions.....   | 137         |

|  | <u>Page</u> |
|--|-------------|
| Improving Environmental Quality.....Ned D. Bayley ✓            | 144         |
| Environmental Problems and Approaches to<br>their Solution at: |             |
| 1. The Production Level.....Andrew Varley ✓                    | 150         |
| 2. The Processing Level.....David E. James ✓                   | 157         |
| 3. The Consumer Level.....Joseph Havlicek ✓                    | 161         |
| List of Participants.....                                      | 169         |

ENVIRONMENTAL PROBLEMS AND APPROACHES TO THEIR SOLUTION  
AT THE FOOD PROCESSING LEVEL

David E. James

Director of Corporate Quality Assurance, General Foods Corporation

This report describes the affects on the environment of operations at food manufacturing establishments. In the case of animal wastes, the problems at the farm and feedlot are wastes that contaminate air, water, and land. By delivery of the animals to a meat slaughtering and packing plant, we concentrate the problems, as well as processing the animals. Liquid wastes of the food industry can be characterized by a high BOD (Biological Oxygen Demand), large amounts of suspended solids, and the use of substantial quantities of water. Generally, water pollution is the most serious problem in the food industry, with solid waste generated by processing, and air pollution following in declining order of severity.

The value of food and kindred products shipped in 1970 in the United States was 97.5 billion dollars. I note by your program that your work group sessions cover several of the categories. We have about 50,000 food processing plants in the USA and I will try to highlight the characteristics of some of the principal groups.

Dairy products shipments amount to 13.5 billion dollars and involve some 7,500 establishments. The small business nature -- 20 employees or less -- is a significant characteristic. For example, 77% of the 1,031 establishments producing natural and processed cheese employ 20 or less people. Sixty-four per cent of the creamery butter plants have fewer than 20 people; 53% of the fluid milk plants have fewer than 20 people. I believe it is important to recognize that the food industry's capability for undertaking pollution abatement measures is related to size of the company. Many small companies are located in rural areas that do not have the convenience of a nearby municipal treatment plant. All of the dairy companies operate in a highly competitive market with many establishments operating at marginal or low profit levels.

The same small companies do not have the financial resources or the trained technical people to work on the pollution problem if they have one. In cheese plants, they have a problem of disposal of whey. While some whey is dried or processed into lactose, the sugar in milk -- over half of the whey -- cannot be economically treated as a by-product. Research is underway to help reduce the impact of the whey problem.

For those dairy plants, such as ice cream and other establishments in urban areas, the liquid wastes, fortunately, are biodegradable, and therefore, joint treatment with municipal sanitary wastes is a preferred solution.

The food industry wastewaters do not generally contain toxic chemicals such as may be found in other industries. We are very dependent upon having good quality water to wash and sanitize our equipment. Cooling water is needed to run the refrigeration required to cool and protect the safety and

quality of our products. In perspective, dairy products in 1964 were estimated to be responsible for 0.44 per cent of the total wastewater volume, 1.8 per cent of the BOD, and 1.3 per cent of the suspended solids.

Another group, canned and frozen fruits and vegetables, produced 9.6 billion dollars of products last year in about 2,500 establishments. Forty per cent of the canners have fewer than 20 full time employees. In addition to the small business nature and highly competitive costs, these processors have a seasonal problem. When the crop is ready, the plant must take it. Waste treatment facilities, as well as the rest of the plant, will often sit idle and non-productive for several months of the year. Canned and frozen food products were responsible for 0.66 per cent of the total manufacturing wastewater volume in 1964, 5.4 per cent of the BOD, and 3.3 per cent of the suspended solids. The canners' wastes are compatible with municipal sanitary wastes. The liquid wastes need to be screened to remove some of the solids before further treatment.

About 62% of the cannery waste is handled by municipal waste treatment facilities. Urban processors of ice cream and fluid milk products discharge about 80% of their liquid wastes to municipal systems. However, rural factories producing cheese, butter, and milk, dispose of only 10% of their wastewater into municipal systems. These approximate figures suggest the water pollution problem may be greatest for a small food business in rural locations.

Solid wastes are the second most important environmental concern of food processors. For example, on a visit to one of our plants last fall, we had a count of 150 truckloads of crops coming in during one day to be processed (corn, cauliflower, and brussels sprouts) and 100 truckloads of solids wastes going out as animal feed. The corn fodder is a desirable feed. In 1967, a study in California showed food processing solids wastes represented 3% of the total wastes. Agricultural solid waste (manure, fruit and nut crops, field and raw crops) in comparison were 48% and municipal wastes were 32%.

Much of the waste resulting from trimming foods is similar to the waste generated in household kitchens. It can cause odor and other problems, such as decay, and attract insects if not handled promptly and properly. The same 1967 California study showed 30% of the solid food waste was disposed of as animal feed, 31% in landfill, and 12% spread on fields, and the balance by other methods such as charcoal production, ocean dumping, etc.

Overall, the major sources of air pollution are motor vehicles (42%), industrial processes (14%), fuel combustion in stationary sources (21%), solid waste disposal (5%), and forest fires (8%). It is estimated that less than one per cent of industrial air pollution is generated by the food processing industry plants.

The food grains, such as processed by millers and cereal processors, give off some particulates which require conventional dust collectors.



Processing odors from onions, bread baking, and coffee roasting are examples of odors that may be objectionable to some but which do not normally affect health. Smoke and particulates from burning of certain non-usable solid materials, such as cobs and hulls, may also be a problem.

Recent Federal air pollution control laws have required changes in the game plan to limit emissions and achieve acceptable air quality. The Clean Air Act of 1970 calls for basing emission standards on the best available control technology. The old picture of smoking chimneys as a sign of industrial activity does not meet the desire of most people to have air as clean as possible. One approach we are taking is to change to clean fuels and replace older equipment used in generating steam. The cost of low sulfur fuel to some in the food industry is a serious concern. Obviously, the cost must be reflected in product pricing to get the needed benefit of cleaner air.

Noise pollution affecting the general public is not a significant problem for food processors.

Contaminants in our water, such as mercury, have posed significant problems to fish processors. We have a broad concern for the environment. We need clean water for food safety. We need clean air to ventilate our plants and process the products. Our standards of food sanitation require good manufacturing practices at all food plants. This requirement of cleanliness has generally helped the food processor be a good neighbor.

Time doesn't permit detailed comments on some segments, such as the 25 billion dollars meat and poultry business. The situation has been documented and approaches to the solution of some of the problems appear in a NIPCC Report, "Animal Slaughtering and Processing".

NIPCC is the National Industrial Pollution Control Council, an advisory council of top executives in all industries. These executives in NIPCC have made significant efforts to report the status, make commitments, and give practical advice to government.

Overall, environmental concern of food processors is a legitimate concern. We are not at the top of the list of major polluters. Industry must abate pollution along with agriculture, government, and all private citizens. All must make a commitment and sacrifices to end causes of pollution. There is reason for some optimism as to the capability of many members of the food industry to master and control their environmental problems. Many companies have on-going pollution control programs to take care of their problems.

We have given local publicity to the correction of our own problems so that our neighbors, who may also buy our products, know our commitment to pollution abatement. Generally, industry has a poor rating on its pollution efforts, but publicity will help avoid misconceptions.

We have tried to take a leading role in some small towns to get proper municipal facilities for our wastes as well as the sanitary wastes of the

residents. This involves financial encouragement in terms of user fees and help on the costs for the bond issues. The approaches to being a good neighbor involve action as well as publicity.

On an industry-wide basis, food processing profits, as related to sales, averaged about 2.5% compared to well over 5% in all manufacturing industries. This relatively modest sales-profit ratio in the food processing industry reflects the intensity of competition. Measured in terms of the number of brand labels seeking the consumer's favor, the food processing industry is among the most competitive of the Nation's businesses. We cannot afford many negative votes by the consumer for whatever he or she wants with respect to pollution.

The narrow profit margins and high overhead costs require low cost methods of waste treatment. Often the action step is to simply avoid any wasteful step, such as reducing to a minimum the amount of water used. Recycling of waters, dry cleaning instead of water cleaning, are not exciting or unique changes, but they get the job done.

In closing, give us the knowledge to change what we can -- the strength to endure what we cannot change -- and the wisdom to distinguish one from the other.

LIST OF PARTICIPANTS

1971 National Agricultural Marketing Conference  
Denver, Colorado

|                                       |   |
|---------------------------------------|---|
| Howard A. Akers, Washington, D. C.    | Rosser Cobb, Virginia                     |
| George B. Alcorn, California          | Jim Coddington, Washington, D. C.         |
| G. R. Ammerman, Mississippi           | Marlin R. Cone, Colorado                  |
| Dale L. Anderson, Washington, D. C.   | -Joseph R. Corley, Washington, D. C.      |
| Don Anderson, New Mexico              | -James H. Cothorn, Montana                |
| Roice H. Anderson, Utah               | Sam L. Crockett, Washington, D. C.        |
| -Jack H. Armstrong, Washington, D. C. | Richard Crom, Washington, D. C.           |
| Donald Ault, Minnesota                | -Robert D. Dahle, North Carolina          |
| Sonny Bailey, Alabama                 | Jim Davidson, Colorado                    |
| Ben Baisdon, Texas                    | Roy B. Davis, Jr., Virginia               |
| Robert C. Baker, New York             | George R. Dawson, Washington, D. C.       |
| Richard Balander, Virginia            | Walter DeCuir, Louisiana                  |
| James N. Ballinger, Oklahoma          | R. Vernon Divers, Washington              |
| -Quentin Banks, Colorado              | -M. Lloyd Downen, Tennessee               |
| Verne Batchelder, Colorado            | Carol M. Drake, Colorado                  |
| Ned Bayley, Washington, D. C.         | John Early, Idaho                         |
| Richard E. Bell, Washington, D. C.    | Charles Edwards, North Carolina           |
| Norman D. Beller, Nebraska            | Leroy Edwards, Mississippi                |
| James F. Berg, Washington, D. C.      | Burton Eller, Colorado                    |
| Ragnar E. Bergman, Minnesota          | R. M. Engard, Colorado                    |
| Pete Beridon, Louisiana               | -Austin B. Ezzell, Ohio                   |
| -William E. Black, Texas              | -William Farris, Indiana                  |
| P. R. Blackford, Colorado             | Eldon R. Fastrup, Montana                 |
| Ginger Blades, Colorado               | L. A. Feathers, Colorado                  |
| -Schell H. Bodenhamer, Missouri       | Tom Ferrell, Colorado                     |
| Bill Bork, Kansas                     | LaVon Fife, Illinois                      |
| Kenneth Boughton, Kansas              | Robert S. Firch, Arizona                  |
| A. B. Brannock, North Carolina        | -Robert R. Fletcher, Wyoming              |
| Robert E. Branson, Texas              | Tom Fox, Oklahoma                         |
| Gerald W. Briggs, California          | -Charles French, Indiana                  |
| Sammy Brown, Alabama                  | James L. Fries, Missouri                  |
| Stanley T. Browne, Maine              | Paul M. Fuller, Washington, D. C.         |
| James H. Burnette, Alabama            | R. G. Garner, Washington, D. C.           |
| H. W. "Red" Byrd, Louisiana           | Edward R. Gawle, Massachusetts            |
| -C. Curtis Cable, Arizona             | John W. Gillman, Utah                     |
| H. E. Calbert, Wisconsin              | W. H. Gillespie, West Virginia            |
| Charles L. Campbell, North Carolina   | Richard Glandt, Colorado                  |
| J. Phil Campbell, Washington, D. C.   | Jay Glatt, Oregon                         |
| Lee Campbell, Washington, D. C.       | Robert Glover, Georgia                    |
| Proctor Campbell, Georgia             | Marshall Godwin, Texas                    |
| Robert B. Case, Colorado              | Ernest L. Goff, Jr., Massachusetts        |
| William O. Champney, Nevada           | George H. Goldsborough, Washington, D. C. |
| Mary Lou Chapman, Colorado            | Jerry Goodall, Washington, D. C.          |
| William P. Charron, Maine             | Cecil Goodlett, Kentucky                  |
| -Martin K. Christiansen, Minnesota    | William D. Gorman, New Mexico             |

|                                       |                                      |
|---------------------------------------|--------------------------------------|
| Truman Graf, Wisconsin                | Leonard W. Kramp, Illinois           |
| Ashley Gulich, Washington, D. C.      | Lyle Kreps, Iowa                     |
| Dale Gullickson, South Dakota         | Kenneth Krogh, Washington, D. C.     |
| Cliff Hagen, Minnesota                | Clyde Lacey, Oklahoma                |
| Lloyd C. Halvorson, Washington, D. C. | George Lackman, Montana              |
| John K. Hanes, Washington, D. C.      | W. J. Lanham, South Carolina         |
| -A. H. Harrington, Washington         | Henry Larzelere, Michigan            |
| Joseph Havlicek, Indiana              | Merl Legg, Oklahoma                  |
| Wayne Hawkins, Florida                | Robert Liebenow, Washington, D. C.   |
| Floyd F. Hedlund, Washington, D. C.   | John A. Love, Colorado               |
| Peter H. Heinze, Maryland             | Jeannette Lynch, Washington, D. C.   |
| Cecil E. Hellbusch, Colorado          | Al Madsen, Colorado                  |
| Hal Hellebust, Kansas                 | John E. Mahoney, Maryland            |
| Peter L. Henderson, Washington, D. C. | William T. Manley, Washington, D. C. |
| Jack Hertzler, Wyoming                | Robert March, Washington, D. C.      |
| Don Hervey, Colorado                  | Merle J. Markley, Pennsylvania       |
| B. G. Hicks, Tennessee                | Linda Matasovic, Illinois            |
| Charles A. Hines, Michigan            | Russell Mathews, New Mexico          |
| Harold H. Hoecker, Maryland           | Kary Mathis, Florida                 |
| David L. Holder, Virginia             | Glynn McBride, Michigan              |
| O. Wendell Holmes, Oregon             | Lyman D. McKee, Wisconsin            |
| M. E. Holmquist, Colorado             | George B. Meyer, Jr., Virginia       |
| Virgil Holt, Colorado                 | Lila Middleton, Colorado             |
| -Sharon Q. Hoobler, Washington, D. C. | Leland R. Miller, North Dakota       |
| Kenneth Hood, Illinois                | William Miller, Maryland             |
| F. E. Horan, Illinois                 | Robert H. Moats, Illinois            |
| Leonard Horn, Colorado                | Lewis L. Monroe, Mississippi         |
| Varner G. Hurt, Mississippi           | Clemon Montgomery, Texas             |
| L. G. Hyman, Washington, D. C.        | John C. Morrison, Colorado           |
| Cristina S. Irvin, New Jersey         | W. R. Morrison, Arkansas             |
| -Jack T. Ishida, Hawaii               | Ralph E. Morrow, Michigan            |
| Robert L. Jack, West Virginia         | Gerald Mueller, Colorado             |
| O. A. Jackson, Colorado               | Tony Nigro, Washington, D. C.        |
| David James, New York                 | Morton Nitzberg, New York            |
| -Letta W. Jasper, Colorado            | Carl O. Norberg, Colorado            |
| Oscar Jaynes, Colorado                | -Lewis F. Norwood, Washington, D. C. |
| Clinton Jeffers, Colorado             | Rei Nukaya, Colorado                 |
| Edward Jesse, Washington, D. C.       | Hugh Oakley, New Jersey              |
| Roy B. Johnson, Louisiana             | Ray Obrecht, Colorado                |
| Richard Johnston, Oregon              | James Olson, Idaho                   |
| Allen R. Jones, Colorado              | R. C. Orr, Florida                   |
| Dick Jones, Illinois                  | Robert E. Parajon, Florida           |
| Joseph A. Jones, Colorado             | Noah E. Perry, West Virginia         |
| Susan Jones, Colorado                 | Gerald L. Pitt, Illinois             |
| Ted L. Jones, Ohio                    | -J. F. Pittman, South Carolina       |
| George D. Kemper, West Virginia       | Elroy M. Pohle, Colorado             |
| James Kendrick, Nebraska              | Charles W. Pope, Louisiana           |
| Edward D. Kern, Alaska                | -John T. Porter, Washington, D. C.   |
| Ken Kirkpatrick, Colorado             | Tom Porter, Washington, D. C.        |
| -M. B. Kirtley, Illinois              | -Homer S. Porteus, Washington, D. C. |
| E. Fred Koller, Minnesota             | Roy Potas, South Dakota              |

H. Joseph Pratt, Montana  
 Dale Prejean, Louisiana  
 Kent W. Pridey, Colorado  
 George E. Pringle, Puerto Rico  
 B. D. Raskopf, Tennessee  
 - Robert Reierison, Colorado  
 John L. Remley, Ohio  
 Donald Ricks, Michigan  
 - Russell Robertson, Kentucky  
 George Roche, Maryland  
 Wilbur Rogers, Colorado  
 Floyd E. Rolf, Colorado  
 Maurice B. Rowe, Virginia  
 John Rue, Washington, D. C.  
 B. W. Sadler, Virginia  
 Larry Samuel, Missouri  
 Rebecca Sanford, Washington, D. C.  
 - W. Neil Schaller, Illinois  
 - R. W. Schermerhow, Oklahoma  
 Pete Schmerge, Colorado  
 Stephen C. Schmidt, Illinois  
 William Schroeder, South Dakota  
 Joe E. Scott, Arkansas  
 - Raymond C. Scott, Washington, D. C.  
 A. D. Seale, Jr., Mississippi  
 Velma Seat, Oregon  
 Gerald Sheldon, Washington, D. C.  
 Willie Sheridan, Louisiana  
 Harvey G. Sitler, Colorado  
 Duane A. Smith, Maine  
 James E. Smith, Oklahoma  
 Philip Smith, Kentucky  
 - Ruth Sneed, New Mexico  
 Marvin H. Snyder, West Virginia  
 Carl Sorenson, Texas  
 Robert A. Souza, Hawaii  
 James N. Spangler, Colorado  
 Thomas Sporleder, Washington, D. C.  
 - George Stachwick, Michigan  
 Dale Stansbury, Texas  
 James S. St. Clair, Wyoming  
 John Stencil, Colorado  
 Joseph H. Stevenson, Washington, D. C.  
 John W. Stewart, Washington, D. C.  
 Leslie F. Stice, Illinois  
 John D. Stiles, Florida  
 V. Robert Strain, Iowa  
 W. C. Stringer, Missouri  
 David R. Strobel, Washington, D. C.  
 Jim Swiercinsky, Kansas  
 Paul Swisher, Colorado  
 Kenneth A. Tannar, Michigan  
 Curtis F. Tarleton, North Carolina  
 - Morris H. Taylor, Utah  
 Robert F. Thayer, Wisconsin  
 Gene Thompson, Missouri  
 Eric Thor, Washington, D. C.  
 Jim Tiner, Arkansas  
 Carol Tisch, Washington, D. C.  
 Jim Toomey, Washington, D. C.  
 Richard Tretsveh, Minnesota  
 - Edward Uvacek, Jr., Texas  
 Lawrence VanMein, Washington, D. C.  
 Andrew Vannig, Wyoming  
 Jack Varick, Florida  
 Andrew Varley, Iowa  
 - William J. Vastini, New Mexico  
 Jones Vestal, Washington, D. C.  
 Leonard A. Voss, Missouri  
 David S. Walker, North Carolina  
 Spencer B. Walker, South Carolina  
 B. F. Wallace, Mississippi  
 H. W. Walters, Wisconsin  
 - Houston E. Ward, Oklahoma  
 C. A. Watson, Kansas  
 Max Ray Webster, Oregon  
 Felix Welch, Alabama  
 Richard S. Welton, Washington, D. C.  
 Charles B. Whigham, New Mexico  
 R. L. Wilcox, Colorado  
 - Roger H. Wilkowske, Washington, D. C.  
 - J. C. Williamson, Jr., North Carolina  
 Kenneth Wilmore, Colorado  
 James K. Wilson, Alabama  
 R. B. Wilson, Indiana  
 Erwyn Witte, Colorado  
 Marsha Witte, Colorado  
 - William Wood, California  
 Bruce H. Wright, Washington, D. C.  
 Clayton Yeutter, Washington, D. C.  
 J. G. Youde, Oregon  
 John Young, Colorado

