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## TARGETING AGRICULTURAL POLICIES IN NORWAY FOR INCOME MAINTENANCE AND RURAL DEVELOPMENT

by

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# TARGETING AGRICULTURAL POLICIES IN NORWAY FOR INCOME MAINTENANCE AND RURAL DEVELOPMENT<sup>1</sup>

## Introduction

Economic regulation of Norwegian agriculture is interesting for several reasons. (1) Norway's agriculture is one of the most completely regulated with respect to prices and marketing of any market economy of the world, (2) the level of price and income support for agriculture is among the highest in the world, (3) the economic support is highly targeted with respect to income and rural development objectives, and (4) apart from judging whether or not the prices and incomes should be supported at the specified levels, the Norway's regulation appears to be relatively successful in meeting stated program objectives. Thus, examination of this program may provide useful guidelines and lessons for application of agricultural price and income support in other countries. The purpose of this paper is to review the development of Norway's agricultural policy, compare levels of agricultural prices supports to those in the U.S., and to examine (suggest) some of the consequences and problems of that regulation.

## Norway's Economy and Agriculture

Norway is the most northern of European countries. A large part of its land mass lies above the Arctic Circle. It has a population is 4.2 million. Major economic activities are fishing, forestry and wood products, agriculture, shipping, and minerals. In recent decades, oil production from the North Sea has provided considerable employment and income growth. Norway, in 1988 ranked 4th in the world in per capita income at \$20,020, ahead of the U.S. which was at \$19,780.<sup>2</sup>

Only 3 percent of Norway's land area is cultivated. The remainder is mountains and forest land. The farm sector is comprised of 98,000 farms. Tillable land area per farm is small by most developed country standards, an average of 9.8 hectares in 1987. More than 70 percent of forest land is held by farmers with an average of 43 hectares of forest per farm holding.<sup>3</sup> Agriculture is dispersed throughout much of the country extending well above the Arctic Circle. Three areas of the country have relatively large amounts of flatlands that are intensively farmed, the southeastern area around Oslo, the southwest,

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<sup>1</sup>This paper is based on the work and discussions with my colleagues at the Distrikthogskole (District College), Steinkjer, Norway, fall quarter 1989. I am especially indebted to Mr. Torbjorn Skjerve (amaneusis) of that College for his efforts in providing me with background and information for this report.

<sup>2</sup>Minneapolis Star Tribune, December 30, 1989.

<sup>3</sup>"Report on Norwegian Agriculture and Agricultural Policy," Norwegian Ministry of Agriculture, Oslo, November 1988

an area in the extreme southwest, and a central region around Trondheim. Farms in the remainder of the country are isolated in small mountain valleys, along the coasts and fjords and on islands.

Livestock production (milk, beef, hogs, and sheep) dominates the agricultural sector, providing more than 70 percent of total farm income in 1987. Grain production generates 30 percent of income and 11 percent is generated by horticultural crops.<sup>4</sup>

Norway is quite low in food self-sufficiency with only 54 percent of its food energy met by its agricultural and fisheries sectors. Grains, sugar and fruits are the principal imports. This net import position is significant in that domestic farm prices can be maintained at a very high level without large government outlays. Cheese is the most important food export. Occasionally pork and butter are exported.

### **The Development of Agricultural Programs**

Agricultural price and income policies in Norway, like those of many other countries, have much of their origins in emergency economic programs of the 1930's that were designed to deal with the severe world wide depression. They were often intended to be of short term duration. The food shortages of World War II prompted many governments to continue and expand these programs to assure increased self-sufficiency in basic food stuffs. Most of the agricultural programs have been continued to provide price and income security to the farm sector and, in Norway, to maintain economic activity and population in the rural communities.

As will be described below, economic and political philosophies in Norway have led to much greater government control of the agricultural sector than has been practiced in the U.S. Yet, unlike many highly planned economies that are experiencing tremendous problems of productivity and very low incomes in the agricultural sector, Norway's agriculture is extremely profitable and a wide array of food products in plentiful supply are available to consumers. The objectives of this paper are to provide a review of the historical development of agricultural marketing and price programs in Norway, to describe the essential features of the programs for agricultural sub-sectors (dairy, meat, and vegetables and grains), and to describe how these programs have affected producers, consumers, taxpayers and the trade sector of the economy.

### **Restructuring of Agriculture, 1880-1928**

The 1880's brought major political and economic changes in Norway. It established its own constitution in 1814, but was governed by a parliament appointed by the king of Sweden. In 1886, though continu-

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<sup>4</sup>Ibid.

ing under the Swedish monarchy, it elected its own independent parliament to bring self government to the country. Norway completely separated from Sweden and established its own monarchy in 1904.

At the same time as political independence was being achieved, the widespread development of steamships that increased the worldwide availability of much lower cost grains from North America was having major impacts on Norwegian agriculture. Grain production substantially declined. The economic impact on agriculture was one of the major factors that caused the mass emigrations to the U.S. and Canada. The remaining producers sought tariffs and quotas to protect themselves from foreign competition.

To present their requests to the government more effectively, the larger landholders organized the Farmers Union in 1896. The organization sought the protection of Norwegian agricultural markets by requesting government imposition of import duties. Its membership was primarily the larger landholders in the country. Today, it numbers about 60,000 farmers who, on the political spectrum, are usually members of the Center Party. The party has been successful in continually electing members to Parliament. Although not a majority party, it is usually part of the coalitions that form the government. Success in obtaining import controls did not occur until the 1920's.

The other major agricultural association, the "Small-Holders Association," was organized in 1913. Membership included many of the very small landholders, farm-workers, and farmers on rented farms. It developed close relationships with the Norwegian Labor Party. Because of that relationship and because of its socialist philosophy, it has generally supported low duty protection of agriculture.

Norwegian farmers began organizing cooperatives in the middle 1800's to obtain more market power or control of their markets. The first farmer cooperative was organized in 1856 to produce cheese. A farmer owned cooperative entered the milk distribution market in Oslo in the 1880's. A cooperative livestock slaughtering plant was organized in Oslo in 1910. The Sales Organization for Horticultural Producers was organized in 1930 for the marketing of vegetables, fruits, berries, and potatoes. A purchasing pool to provide producers with fertilizer, feeds, and seeds was first organized in the Oslo region in 1895. By the 1920's farmer cooperatives were major players in all agricultural markets, both marketing of output and for supplying farm inputs.

There was a major reorganization of the cooperatives in the 1930's into regional and national cooperatives and special marketing legislation granted cooperatives major responsibilities for implementing farm price programs. Today, cooperatives dominate the marketing of farm products. The cereal sector has no cooperatives because that sector is completely dominated by the government grain monopoly, the Norwegian Grain Corporation. It is estimated that 60 to 70 percent of all feed, seed, and fertilizer is provided through the Cooperative Purchasing Pool. The milk, meat, and egg cooperatives

have major responsibilities for carrying out many of the provisions of the price and income support schemes for agriculture.<sup>5</sup>

### **Agricultural Policy, 1928-WWII**

Agriculture cooperatives provided Norwegian farmers with the ability to offset monopolistic elements in agricultural marketing, however, they were unable to insulate the sector from the severe economic disruptions of the late 1920's and 1930's. Because of the severe decline in aggregate demand, agricultural prices declined dramatically. Norwegian farmers, as did farmers in all other market economies of the world, faced ruinous prices with consequent farm failures and foreclosures.

The first major effort to deal with reduced farm prices was the creation of the "Norwegian Grain Corporation" by the Parliament in 1928. It was granted monopoly control of all imports and exports of grain. Minimum prices were established for wheat, barley and oats. Because Norway was a net importer of grains, prices could be raised by use of import controls. It selected import duties for this purpose. The Board determined prices on the basis of estimated production costs for a 40 hectare farm that would provide for an adequate household income.

The "Marketing Act" which was enacted by the Norwegian Parliament in 1930 is the authorization for most of the current agricultural price and marketing programs. Its four major provisions provide for funding of programs and the mechanisms for intervention. These are:

1. Funding-Fees were to be assessed at the wholesale market level for all food products to meet costs of regulations. These fees could be changed if necessary to meet increased costs. Additional funding is now provided by special parliamentary appropriations.
2. A countrywide system of agricultural cooperatives was to be formed to carry out marketing regulations with respect to product identity, quality standards, uniform minimum prices throughout the country, and price stabilization. The cooperatives were to have complete responsibility for carrying out the market regulations and were reimbursed for regulatory activities. Marketing funds could be used to construct storage capacity and for carrying out regulatory programs. To maintain equal wholesale food prices in all regions of the country, interregional transport of food products were subsidized either by funds from the marketing fees or direct government appropriations.
3. Cooperatives were to increase markets for food products by programs to increase quality of food products at all market levels and by generic promotion programs.
4. The "Norwegian Marketing Council" was established as an oversight agency to the marketing programs. This council was to have membership from the farm production sector, farmer

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<sup>5</sup>The data and discussion of cooperatives are based principally on: Olav Borgan, "The Agricultural Cooperative System in Norway," Landsbrukets Sentralforbund, Oslo, Norway, 1980.

cooperatives, private industry, consumers, unions, government agencies and the Ministry of Agriculture. The council approved all marketing programs and general expenditures for them. It was responsible directly to the Parliament.

The legislation and cooperative reorganization and consolidations of the 1930's provided the mechanisms and institutions that Norway still uses to administer its agricultural programs. Cooperatives as a consequence have continued to be dominant institutions in all agricultural sectors except grains where the "State Grain Board" has a monopoly on all grain trading. For other commodities, cooperatives control from 45 to 100 percent of the market, Table 1.

Import controls were authorized and minimum prices were to be established for domestic production sufficient to meet domestic demand, with exports made at whatever prices were necessary for disposal. Rigid import restrictions were also imposed. During the German occupation of WWII, most activities of market regulation were suspended.

Table 1. Cooperative Share of Market for Farm Products in Norway, 1978.

	Percent of Total Producers Sales
Milk and Milk Products	100
Meat	74
Eggs	86
Furs	98
Fruits and Vegetables	45
Potatoes for Food	45
Potatoes for Industrial Uses	80
Forest Products	70

Source: Olav Borgan, *The Agricultural Cooperative System in Norway, 1930-1980*, Landsbrukets Sentralforbund, 1980, p. 1.

#### **Agricultural Policy, WWII-1976**

Following World War II, food security became an overriding concern in Norwegian agricultural policy. Additional objectives, additional market interventions, and modification of the method of negotiating the



specific features of intervention were provided by the "General Agreement on Agriculture" in 1951. This made basic changes in the way that minimum prices were to be established and substantially broadened the extent of market regulation. The "General Agreement" provided that minimum wholesale food prices were to be negotiated annually within the Norwegian Marketing Council. As during the preceding years, minimum prices were established at the wholesale level of the market, not at the farm level. A major change was that the "Farmers Unions" instead of the cooperatives were to represent the interests of the producers. Nevertheless, cooperatives were to continue as the vehicle through which most market intervention was handled. The "Agreement" also required protection from imports for any product for which prices were negotiated.

The original marketing negotiations considered prices only. The "Agreement" extended the negotiations to almost all types of market interventions: production and marketing quotas, production subsidies, marketing support activities (investments in facilities, freight subsidies, product identity and quality standards), and support of programs to provide assistance to farmers who become sick or disabled and to provide temporary workers for every fourth weekend and an annual vacation for all farmers.

#### **Agricultural Policy, 1977 – present**

A steadily declining rural population in the 1950's and 1960's led to concerns that agricultural policies would lead to reduced self-sufficiency in food production and, more importantly, that agricultural policies were have very adverse impacts on regional economies within the country. Consequently, agricultural policy was revised in 1976 to include (1) specified and measurable income objectives for agriculture and (2) specific regional objectives of agricultural policy. In 1976, the Norwegian Parliament (Storting) approved the following objectives for agricultural policy:<sup>6</sup>

1. Production objectives. Production was to be sufficient to meet domestic consumption requirements for milk, beef, hogs, poultry meat, eggs, and some vegetables. Feed grain production, mainly barley and oats, was to meet domestic needs if possible. Food grain production was to be increased if possible to meet domestic needs. I assume this means as long this achievement does not conflict with other program objectives.
2. Regional development. Agricultural programs were to be managed to maintain population in rural areas. Policies were "to contribute to the overall regional objectives by increasing incomes and developing employment opportunities in areas with imbalances and weak economies."<sup>7</sup> This was to include maintaining as many farms as possible, encouragement of part time farming, and locating marketing and processing facilities to provide employment in rural areas. At least 75 percent of any

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<sup>6</sup>"On Norwegian Agricultural Policy," Report No. 14 to the Storting (1976-77), Oslo, 1977.

<sup>7</sup>op. cit., page 5.

increase in farming area which results from the production objectives should be in less favored economic areas.

3. **Income.** Income per worker in agricultural on a farm of average efficiency should be that which provides the living conditions equivalent to those of the average industrial wage earner (currently about \$22,000). For purposes of implementation, this was to be achieved over a period of 6 years.
4. **Efficiency.** Efficiency gains should be encouraged to match those achieved in other sectors of the economy but not to the extent that the regional development goals are sacrificed.
5. **Environmental quality.** Agricultural programs are to reduce land erosion and soil and water pollution and utilize industrial wastes and by-products for feed or on agricultural land for fertilizer whenever possible. Foods should be produced without chemical residues that are hazardous to human health.

Specific program features and levels of support are determined in the agricultural negotiations with a resulting agricultural agreement. Although negotiations occur annually, the agreements are to cover a two year period. The negotiations for the second year are to make necessary adjustments of prices or controls to respond to new information or new circumstances. The negotiated agreements and the funding required for it must be approved by the Parliament.

### **Specific Program Features**

#### **Determination of Target Income and Price Levels**

Determination of prices and payments to achieve parity of income with non-agricultural workers has evolved into a very structured process. The average income of industrial workers is regularly reported in statistical reports on employment and wages. The Ministry of Agriculture computes the projected net incomes for the coming year for 32 model farms. The models vary according to enterprise type (crop and livestock combinations), location, and size. Data for the projections are from farm records from the preceding year for a sample of participating farms. The farms used are selected to represent farms of average efficiency in the country. The models are normalized for crop and livestock yields, for labor requirements, and capital use. A factor for increasing productivity is also applied. The samples provide net income projections for average sized farms, operating at average levels of efficiency, by commodity and by enterprise combinations at last year's prices and projected levels of input costs. These net farm incomes are divided by average number of person-years required for each representative farm situation to obtain the projected net income per worker.

The difference between net farm income per worker and the average industrial wage is multiplied by the total agricultural employment to determine the change in agricultural revenue needed for parity of incomes. Since 1976, this has consistently required additional farm income. The next step is to determine how much of the additional income is to be achieved by increases in prices and how much by

direct transfers to producers. Recently, this has been about 60 percent through price and 40 percent through direct payments.

The shares of targeted income increases are allocated to producer or wholesale prices or to subsidy payments to obtain the target income for the market year. Except for wool and grains, these are target wholesale prices, not guaranteed producer prices. It is anticipated that the target producer price will be achieved by the fixing of wholesale prices. The price, income transfers and other programs requirements for the major agricultural enterprises are described below.

## **Dairy**

Milk production is one of the major Norwegian agricultural activities. Milk accounts for approximately 35 percent of gross farm income. Dairy animals are an important part of the total beef supply and a principal user of domestic feed grain production.

The dairy cooperative Marketing of farmers' milk is entirely controlled by a single farmer cooperative, the National Association of Norwegian Milk Producers/Norwegian Dairies Association. It purchases all milk from producers. It processes and manufactures all manufactured dairy products except for a small amount of milk sold to processors for ice cream and novelties. The cooperative has 10 regional divisions with each division having its own group of producers from which it acquires milk.

Price provisions Almost all price and income support to milk producers are channeled through the cooperative. Price support is achieved by the fixing of wholesale prices for dairy products. As described above, models of the representative dairy farms from the sample determine the income changes to generate the per farm worker income equal to that of the average industrial worker. The dairy marketing cooperative is also requested to provide data on how costs of processing the various dairy products have changed and projections of changes for the next year. This estimated change in marketing costs for all dairy products plus the required change in farm income is the change in gross wholesale revenue of the marketing cooperative needed to generate the targeted wholesale milk price. This total revenue change is divided by estimated total milk use in all domestically consumed dairy products to obtain the per kilogram change in revenue for the next year. The share to be achieved through price is added to the preceding year's wholesale dairy product prices to determine revised wholesale dairy product prices. These are maximum prices that the dairies can charge buyers for milk products. A milk quota is also determined for each milk producer. The quota is each producer's share of estimated total domestic milk use which has been calculated on a historical production base of the farm.

Marketing negotiations for the dairy sector require an allocation of the wholesale revenue change (always an increase) to the individual dairy products, e.g. butter, cheese, nonfat dry milk, ice cream, and

fluid milk products. Wholesale price adjustments for the individual products are calculated to generate the total wholesale revenue change. This wholesale revenue change is expected to be sufficient to permit the cooperative to pay the target farm price. Because prices are fixed for products, not the processors' buying prices for milk according to use, as in the U.S. and Canada, there is no explicit price discrimination between market segments. Nevertheless, there appears to be implicit price discrimination because the net returns after deducting estimated marketing (processing costs) for fluid products exceeds that for milk used in the manufactured dairy products.

The National Dairy Cooperative operates a single revenue pooling system for the entire country. The total wholesale revenue from all products sales less the average costs of handling and processing is divided by the quantity of quota milk production to determine the average producer milk price. Producer prices include a seasonal adjustment to encourage production that is in line with demand throughout the year. Producers are paid by the dairy plant to which they deliver their milk. Because of the difference in net return for milk according to dairy products handled by each plant, the national cooperative operates an equalization fund. This activity collects funds from plants that process low manufacturing cost products and pays plants that process high manufacturing cost products. All calculations are based on costs for plants with average operating efficiency for each of the products. Consequently, plants that are able to achieve lower operating costs than average are able to pay a higher price to producers than plants that have high operating costs. This mechanism encourages management of dairy plants to achieve the maximum possible operating efficiencies.

Although the cooperative pooling mechanism encourages maximum operating efficiency from the existing marketing system, it lacks a strong incentive for restructuring of the processing and marketing system to reduce costs. The pooling of returns is based on the efficiency and costs of the existing system. Dairy plant consolidations or relocations that could reduce costs are made by administrative decision of the overall cooperative board. But, producer members of the individual plants and other community groups where the dairy plants are located are reluctant to close plants. Farmers feel that they lose control of their cooperative as activities become more centralized and employment is lost in the communities that lose dairy plants. Furthermore the regional development objectives of farm policy are a crucial concern when considering dairy plant closings.

Milk producers are paid the target price of their cooperative only on quota milk. Mandatory quotas were first required in 1983. A dual price system with higher prices paid to producers who reduced production was previously in effect. Quota milk for all dairy farmers is that quantity of milk that equals domestic milk use in all products at the target level of prices. The quota is adjusted each year to reflect changes in milk demand. Total demand has been very stable during the last decade, thus the total quota has been stable. Milk in excess of quota milk receives only the price that can be obtained in secondary markets, either export or animal feed. This is a small fraction of the price of milk sold within quota and is well below the marginal costs of milk production.

Producer milk quotas can not be bought and sold. An additional quota can be obtained only if domestic milk use increases or if farms cease milk production. That quota reverts to the milk pool and can be reallocated to existing producers or to producers who have expanded their farm size. The milk quota accompanies the farm when a farm transfer is made.

Subsidies Milk producers also receive several price subsidies to achieve the predetermined income levels. Some subsidies are tied to the levels of milk production, some are tied to other characteristics of the dairy farm. The milk related subsidies are: (1) a general price subsidy paid to all milk producers, (2) a quantitatively limited subsidy that is paid only on the first 30,000 liters of annual milk production, and (3) a regional price subsidy on milk volume to producers in the less favorable agricultural areas. The subsidies are paid by the dairy cooperatives through local units, but the cooperative is reimbursed from the national treasury for the payments. The latter two subsidies are designed to maintain small farms and farm numbers and to encourage farming and economic activity in less favored regions since the per unit milk payment declines with increased milk volumes and increases for the more remote and less favorable farming areas.

Additionally, milk producers receive subsidy payments according to the number of animal units on the farm and the area devoted to forage production. These are administered and paid by the equivalent of the ASCS offices in the U.S. Each farmer files a report twice annually on total land area, land in crops, and number of animals by age and sex. Payments are made twice annually. The payment schedules provide for the highest payment for the first 11 cows and the first 4 to 5 hectares of forage equivalent. Payments decline for additional animals and additional forage production. In the more favorable agricultural areas, no payment is received beyond 22 cows. Payments are higher in the less favorable agricultural districts with respect to distance from markets and land quality. Farms in more hilly or mountain areas and northern Norway receive higher payments. These payments therefore favor small farms and tend to retain farming in the poorer districts.

Producer returns Both the payment subsidy schemes associated with milk production and those associated with other farm characteristics are designed to maintain farm numbers and small farms and to expand or maintain economic activity in rural communities. If not for these payments, many producers would be inclined to shift into grain production or, perhaps, to exit farming entirely. Table 2 illustrates the differences in payments for milk between small northern Norway dairy farms and larger southwestern Norway farms for 1988-89. Note that average total milk payments per liter of milk decline with size of herd. The regional subsidy, the quantitatively limited subsidy, and the livestock production subsidy add substantial per unit revenue for the small dairy producers in northern Norway as compared to those in the south. Total subsidies are 63 percent of the revenues in the north and 32 percent in the south. Thus, transfer payments account for a large part of total farm income in all regions, but more than half of farm income for small northern dairy farms.

For these two farm situations, the total payments per liter of milk to producers in the north was 61 percent higher than in the south. Because dairy farming is such an important component of Norwegian agriculture, the price and subsidy schemes for the sector are considered crucial to farmer welfare as well as to the economic base of most rural communities. The regional and size differentials in payments strongly reflect these policy objectives.

To compare with returns to milk production in the U.S., the figures in Table 2 were converted to dollars per hundredweight of milk using the February 1, 1990 kroner to dollar exchange rate. The target market prices are \$18.17 and \$20.50 per hundredweight, respectively for small and large dairy farms. Total returns after all possible subsidies are \$49.06 and \$30.31 per hundredweight, respectively, for the small and large dairy farms. The average 1989 U.S. milk price was \$13.49 per hundredweight.

### **Red Meats**

Norwegian red meat production includes beef (about 40 percent) which is largely from the dairy herds, pork (about 47 percent), and mutton and lamb (about 12 percent). Norway is essentially self-sufficient in red meat production. Small quantities of imports and exports have been required in the 1980's to balance the market. Livestock are produced throughout the country with most regions producing an excess that generally moves to the Oslo market.

Production units are small. Dairy herds, as noted previously, average 11 to 12 cows, hog operations average 14 breeding animals, and sheep producers average 35 breeding animals.<sup>8</sup> The size of a hog operation was statutorily limited in 1975 to production of 500 pigs annually. In 1988, a further restriction was imposed to limit units to 33 breeding sows.

The meat cooperative The Norwegian Farmers' Meat Marketing Association (NKF), a cooperative, is the major marketing organization for red meat, but it is not a monopoly as is the case in dairying. It acquires and slaughters about 80 percent of all meat animals purchased from farmers. Private slaughtering plants handle the remainder. It plays a key role in assuring that livestock producers receive the price targets established in the 'agricultural agreement'. The cooperative coordinates and administers all meat pricing regulations, and establishes grades and standards for meat and livestock. It is organized into 10 regional operating divisions. Producers are members of the regional divisions and must deliver their animals to their region's slaughtering plants. Each division operates slaughtering

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<sup>8</sup>"Meat Production in Norway," Report of Norges Kjøtt og Fleskesentral (the Norwegian Farmers' Meat Marketing Organization), Oslo, Norway, 1989.

Table 2. Payments per liter for milk to producers in Norway by location and herd size, 1988-89.

Payment component	7 cow herd North Norway	24 cow herd Southwestern Norway
	Kroner/liter	
Average cooperative pay price to producers	2.50	2.82
<u>Subsidies related to milk volume</u>		
General milk price subsidy	.38	.38
Quantitatively limited subsidy	1.50	.42
Regional price subsidy	.62	-
<u>Other subsidies for animal production</u>		
Animal unit production subsidy	.68	.17
Forage production subsidy	.59*	.12**
Subsidy for feeding own produced grain		.04***
Assistance for labor replacement	.48	.22
<u>Totals</u>		
Total revenue per liter	6.75	4.17
Total subsidies	4.25	1.35
Subsidy as percent of total revenue	63	32
*Calculated for 11 hectares of forage production.		
**Calculated for 15 hectares of forage production.		
***Calculated for 7 hectares of barley.		
Source:	Calculated and based on data from, "Overview of Norwegian Agriculture and Agricultural Policy," Ministry of Agriculture, Oslo, Nov. 1988, page 20 and from figures in "Avtaleguide 1989," Norwegian Ministry of Agriculture.	

and processing plants and freezing and cold storage facilities. The central office of the NKF coordinates the routing of meat from the surplus regions to the deficit regions. Costs of interregional meat shipments are reimbursed by the state. The purpose is to permit a single level of wholesale, and presumably retail prices, throughout the country. The NKF and the private slaughtering plants are also engaged in additional meat processing activities and they sell to food retailers, food service firms and to other meat processors.

The NKF is charged with handling surplus meat production. The annual marketing negotiations for meat animals determines a national production target to meet total domestic meat consumption at the negotiated prices. No production quotas are specified, however. If meat production is within the

targeted production, but in excess of domestic commercial use, the cost of handling and disposing of the surplus by the cooperative is reimbursed by the government. These costs include freezing and storage costs, inter-regional transport, necessary price reductions to dispose of frozen meat in the domestic market or in foreign markets at world prices. For 1989, these costs were estimated to be 200 million kroner (\$29 million). For surpluses in excess of the production target, costs of handling and disposal are assessed against livestock producers.

Price fixing Target returns for livestock are established on a slaughtered carcass basis for the individual animals through the annual marketing negotiations as described above. Part of the returns is through the market and part through direct subsidies. Changes in the total target return for each year are added to the wholesale values of the carcasses to fix wholesale meat prices. Thus, negotiation of annual prices requires estimates of the costs of assembly, slaughtering, and by-product values and the marketing regulation assessment to fix the wholesale price for livestock in carcass form. Prices are fixed for a standard grade. Quality differences from the standard are determined by market forces. The NKF is allowed to make adjustments in prices to encourage or discourage livestock deliveries and to regulate cattle deliveries throughout the year. The wholesale prices are maximum prices.

Import restrictions are imposed on all meat imports. If NKF's market prices for meats exceed the fixed price by 10 percent for more than two weeks, all import restrictions are to be dropped. If meat shortages do develop, imports of specified amounts are permitted with 80 percent of the import quota allocated to NKF and 20 percent allocated to private meat processors or wholesalers.

Producer returns and supply control measures Producer returns for meat production include several components. There are the market prices that are paid for beef animals, sheep, lambs and hogs according to carcass yield and grade. There are several types of subsidies. Some subsidies are associated with volume of meat sales of each producer. Others are indirectly related to meat sales. The latter are the subsidies for animal production based on animal units on the farm and the subsidies for forage production that are described above. Livestock producers are encouraged to feed grains produced on the farm by a special subsidy on their grain production. Producers are also partially subsidized for farm to plant assembly costs. Thus, a producer's revenue from the livestock enterprise includes the market price paid by buyers, a general subsidy on all meat sales, a district subsidy on meat sales according to location and land quality, a quantity limited subsidy for mutton sales only, an animal unit subsidy to encourage livestock production, a forage unit subsidy to encourage livestock feeding, and a grain feeding subsidy to encourage feeding of home produced grain on the farm.

The per unit sales returns for average sized Norwegian livestock enterprises are illustrated in Table 3. These represent the prices and returns in the less favored agricultural districts. Since they are for the



average size enterprise, they do not show the variations in subsidies according to size of unit or sales. High proportions of beef and sheep revenues are generated by subsidies (deficiency payments), 40 and 55 percent respectively. Its also important to note that much of the beef supply is produced by the dairy herds. The example of payments is illustrative of beef producing operations only.

Table 3. Payments for livestock production in Norway 1989 for average size unit and for highest subsidy region.

Payment component	Beef	Hogs	Sheep
Kroner per kilogram			
Target market price for meat	36.15	30.65	38.10
<u>Subsidies related to meat sales</u>			
General subsidy*	4.35	0	6.30
District differentiated subsidy	11.30	0	13.10
Quantity limited subsidy (mutton only)			
First 1400 kilograms of sales			9.50
Sales above 1400 kilograms			4.70
<u>Other subsidies for animal production</u>			
Animal unit production subsidy	5.86	1.71	5.96
Forage production subsidy	3.89	10.35	
Subsidy for feeding own produced grain	.29	.70	.44
<u>Totals</u>			
Total revenue per kilogram	61.84	33.06	85.48**
Total subsidies	24.69	2.4	47.38
Subsidy as percent of total revenue	40	7	55
* This subsidy is varied throughout the season to compensate producers for price adjustments of buyers who are permitted to adjust prices to reflect market conditions.			
** Sheep producers also receive revenue from wool sales and a deficiency payment to achieve a guaranteed price.			

Supply control To prevent meat production from exceeding domestic consumption requirements, several mechanisms have been used. Slaughter premiums on suckling calves have been used in the 1980's to encourage animal sales. Maximum slaughter weights for bulls and steers above which a lower price was received were used in 1985. Premiums on slaughter of breeding sows were paid in 1987. In 1988 a hog buy-out program paid producers to exit pig production for at least three years. Currently, there is a weight limit on slaughter hogs. A much reduced price is paid on weights above the limit.

For comparisons with U.S. prices, the meat prices and returns were converted to dollars using the February 1, 1990 exchange rate. The target market prices convert to liveweight prices of \$148.13, \$152.25, and \$131.21 per hundredweight respectively for beef, hogs and sheep. Total returns after subsidies convert to \$254.26, \$164.68, and \$294.37 per hundredweight respectively for beef, hogs and sheep. U.S. meat prices for 1989 were \$79.00 per hundredweight for slaughter steers at Omaha, \$53 per hundredweight for lambs and \$48.50 per hundred for hogs.

### **Grains and Oilseeds**

Wheat, barley, oats, and rye are the principal grains that are produced in Norway. Its grain policies have resulted in near self-sufficiency in feed grains in some years, but domestic food grain production accounts for only about 1/3rd of domestic needs. Major suppliers of wheat are Sweden, Canada, Australia and the United States. Rapeseed is the principal oilseed, but production is far from meeting domestic edible oil needs. Some protein supplements are imported for animal feeding; soybean meal, cottonseed meal, etc.

The State Grain Board The key institution in grain marketing in Norway is the "State Grain Board" which was established in 1928. It has a complete monopoly for all grain marketing activities within Norway and for all imports and exports. It is obligated to buy all grain offered to it by Norwegian producers at the fixed prices. It also has responsibility for maintaining a strategic food reserve; currently one year's stocks of food and feed grains are stored for this purpose. Although all farm sales are made to the Board, most handling of the grain, receiving, storage, and processing is done by cooperative and private processors of grains. These users, feed manufacturers and millers, purchase grains from the State Grain Board. On-farm storage of grain is encouraged by storage payments to farmers.

Prices in the domestic market are maintained by import duties. Because domestic grain prices are much higher than world prices, the Board generates substantial profits on imports. These profits of the Grain Board are remitted to the national treasury. Prior to 1973, profits were retained by the Agricultural Marketing Board to finance market regulation activities for other commodities.

Grain prices The objective of grain prices has been to become self-sufficient in feed grains and to produce as much of food grain needs as possible. If production were to exceed domestic needs, the target price would be maintained only for that quantity of grain used for the domestic market. In order to offset the incentives for animal production because of the high target returns for those sectors, grain prices have been set at very high levels relative to world prices or target levels in other countries. The high prices have encouraged grain production wherever feasible with the consequence that the more favorable crop producing regions, particularly in the southwest and southeast, have largely shifted

away from livestock. The high feed grain prices also encourage the livestock producers to use coarse fodder in beef, milk, and sheep production.<sup>9</sup>

Two prices are fixed for each of the grains, one for food quality grain, one for feed quality grain. Unlike the meat and dairy sectors where farm prices of the 'agricultural agreement' are target prices, grain prices are guaranteed. Support prices for grains are calculated to permit a farmer with 40 hectares to obtain the per-farm worker income target. Prices are established for four geographic zones. Higher prices are paid to those producers in the northern areas of Norway and on poorer quality land. Production costs for determining the prices are calculated for the farm models described above.

The schedule of prices by zones converted to U.S. dollars is presented in Table 4 along with the average 1988 U.S. target prices. The zone differences are designed to offset increased production costs in the less favorable production areas, the northern regions and the more hilly areas. Norwegian prices are three to four times U.S target farm prices for 1989. International trade prices for wheat in 1989 ranged from \$3.80 to \$4.00 per bushel. Since the Norwegian Grain Board sells imported wheat at the domestic price levels, imported grain generates \$8.00 or more per bushel of imports which is used to cover its costs of operations or to be remitted to the national treasury.

Table 4. Norwegian Farm Level Purchase Prices for Grains (1989)\*

	Zone 0	Zone 1	Zone 2	Zone 3	Average U.S 1989 target price
<b>Food quality</b>					
Wheat	\$12.87	\$13.41	\$14.20	\$14.87	\$4.10
Rye	11.65	12.16	12.91	13.53	-
Barley	8.62	9.05	9.69	10.23	-
Oats	5.07	5.37	5.79	6.15	-
<b>Feed quality</b>					
Wheat	\$10.28	\$10.77	\$11.49	\$12.11	-
Rye	9.36	9.83	10.49	11.07	-
Barley	7.92	8.32	8.89	9.39	2.43
Oats	4.66	4.92	5.30	5.64	1.50

\*Computed on a per bushel basis using February 1, 1990 currency exchange rates.

Two subsidy payments may be received for grain production. (1) subsidy payments are made to producers who utilize their own grain to encourage use of grains for livestock feeding on farms where it is produced. For wheat, rye, barley and oats, these payments on a per bushel basis are 42, 30, 81, and 30 cents (U.S.), respectively. (2) subsidy payments are made to producers who hold grain for sale

<sup>9</sup>"Overview of Norwegian Agriculture and Agricultural Policy," op. cit. pp. 28-29.

in the following spring to encourage construction of on-farm grain storage. Investment grants and loans are also available for construction of those facilities.

### **Poultry and eggs**

Egg consumption in Norway is near that of most other European countries and the U.S. but poultry meat consumption is very low, 3.7 kilograms per year compared to 30.4 kilograms in the U.S. and between 10 and 20 kilograms for other west European countries. Almost all consumption is from domestic production.

Producing units are considered small compared to other developed countries. This is due, in large part, to limits on maximum size of poultry enterprises since 1976. Egg producers can not have more than 2000 hens. When a flock is slaughtered, a new flock cannot be acquired for 10 weeks. Broiler operations are limited to not more than 7000 birds per production period. Each producer has 3 to 4 flocks per year. Some exceptions to size limits are permitted for flocks that exceeded the limits prior to 1976. Nevertheless, flock sizes are very low. Sixty-eight percent of egg producers in 1989 had fewer than 500 laying hens. Only 5.6 percent of the units exceed 2000 hens.

Cooperative role Poultry and egg production is dominated by the 13 regional egg and poultry pools and the Central Norwegian Egg Cooperative. About 85 percent of the egg production and 57 percent of the poultry meat production is controlled by the cooperatives. The remainder is in the hands of private processors. The regional cooperatives assemble eggs and poultry from within the respective regions, and process and sell to buyers within the region. The Central Egg Cooperative coordinates movements of poultry products between surplus and deficit regions.

Producer prices Target prices are annually fixed at the wholesale level through the annual marketing negotiations to achieve the annual income targets. The prices for the 1988-89 marketing season were:

Eggs	\$2.63 per dozen
Broilers	\$2.38 per lb.
Hens	\$1.23 per lb.

Deficiency payments are paid as for other agricultural products, but only to producers who contract with processors for specified deliveries. For eggs in 1989 this payment was \$.12 per dozen if production was within the contracted amount. This cost is reimbursed by the government. The government also reimburses the packers for the costs of egg assembly from farms. There are regionally differentiated

subsidies for broiler meat and eggs in areas more remote from the major markets. Similar to other livestock production, there are animal unit subsidies to encourage production.

### **Fruits and Vegetables**

The horticultural sector contributes about 11 percent of Norwegian agricultural income. Fruits and vegetables are produced on many farms, but imports are necessary to meet consumption needs for many perishable fresh fruits and vegetables outside the short growing season.

The Central Horticultural Sales Organization (the Gartnerhallen) is the only cooperative for the sector. It is charged with much of the market regulation activities for fruits and vegetables. It has about 40 to 50 percent of the total market.

Income targets for fruit and vegetable producers are determined by the farm models. The 'agricultural agreement' determines the share to be achieved through market price and the share to be paid through subsidies. Following that determination, normal seasonal wholesale prices are established for all domestically produced fruits and vegetables. These are the target prices to prevail during the domestic production season and are maintained by import controls. If domestic wholesale prices rise above the target and remain above it for two consecutive weeks, the import quotas are suspended. Outside the regulatory period, imports are free to enter at import prices. This leads to an interesting seasonal price pattern throughout the season in Norway. Fruit and vegetable prices during the production season are higher than during the import season.

To the extent possible, the cooperative attempts to store, process, and move products from surplus to deficit regions to achieve the seasonal normal prices. As part of its activities, the cooperative is a major importer of fruits and vegetables.

Subsidies are paid to producers for fruit, vegetable, and berries on area devoted to production in north Norway with a maximum payment per farm. These currently can be as much as \$80 per acre.

### **Other Agricultural Support and Food Programs**

Most of the domestic price support schemes in Norway are protected by import quotas and/or duties. When price limits are exceeded by specified amounts for some products or when domestic production is insufficient, imports are permitted. If imports do occur at less than target or guaranteed prices, variable levies are imposed or, for grains, the State Grain Board resells at domestic price levels.

Numerous investment aids are provided. Grants, favorable loans, or a combination are provided for farm buildings and equipment, for land drainage, and to meet environmental regulations.

To offset some of the high farm product prices on consumer food prices, consumer subsidies are used for major food products. Two major approaches are used. One is government subsidies to the marketing firms to permit them to sell at lower prices than implied by farm prices. These have been applied to flour, dairy products, and meats throughout the country and for some fruits and vegetables in northern Norway. Retailers are also compensated for the VAT (value added tax) on some foods. The consumer subsidies and VAT compensations are designed to encourage or discourage consumption of food so as to meet national nutritional objectives.

Farm structure and land use is directly controlled by government regulations. Legislation provides that the oldest child in the farm family has priority for inheritance or acquisition of the farm. Should there be no children in the family or the oldest child prefers not to acquire the farm, the law specifically provides for the order of access to the farm. All farm transfers must be approved by the government and any buyer of a farm must be qualified to operate a farm and must live on the farm and operate it for at least five years following the acquisition. As noted above, the maximum size of operating units for hog and poultry farms is limited by law. Recently, legislation was enacted which requires use and transfer controls, therefore, complement the price and income programs in limiting farm size. On the other hand, the controls also prevent fragmentation of land holdings.

### **Impacts of Norwegian Agricultural Policy**

The policies described above have numerous and important consequences. Just a few will be described here. First, they generate a much higher minimum income per farm worker than U.S. farm policy. If farms achieve the efficiency norms used in calculation of target prices, annual income per farm worker exceeds the targeted \$22,000 level. Thus, a 15 cow dairy farm which is calculated to require about 1.5 years of labor should generate an annual net income of \$33,000. An 80 acre wheat farm will generate near \$25,000 for the labor and management.

The quantity based subsidies, limits on maximum payments, and the potential for relatively high incomes on small units has resulted in small production units. Income support declines rapidly with size of operation. Maximum subsidy payments are specified for all farm enterprises. As noted above, the average Norwegian dairy farm has only 11.5 cows compared to more than 45 in the U.S. Although farm numbers continue to decline, by about 2.4 percent per year, 62 percent of farms are still less than 10 hectares and only 11 percent exceed 20 hectares, Table 5. Poultry units are small compared to the U.S.

Part time farming has been encouraged or maintained by farm policies. Fifty-five percent of all farms obtained more than half their income from non-farm sources in 1985-86.<sup>10</sup> This may reflect either or

Table 5. Distribution of Farm Number by Size Category in Norway - Selected Years, 1965 - 1988.

Size in hectares	1969	1979	1984 % of all farms	1988
.5 to 1.99	21.5	19.6	13.8	10.2
2.0 to 4.99	35.6	29.9	27.0	24.6
5.0 to 9.99	27.3	26.1	27.5	27.5
10.0 to 19.99	11.6	17.3	22.7	26.3
Over 20.00	<u>4.1</u>	<u>7.1</u>	<u>9.0</u>	<u>11.4</u>
	100%	100%	100%	100%
Total farm numbers	154,977	125,302	107,083	95,796

both, good off-farm employment opportunities for one or more members of the farm households and under-employment of farm workers. Underemployment may result because of the small average size of farms in terms of area of cropland and numbers of animals. Furthermore, income support declines rapidly with size because of the structural objectives of farm policy. Farm workers may find farm employment more remunerative than expansion of farm output. This characteristic of agriculture is consistent with the regional development goals of agricultural policy. It results in a larger number of farmers than could compete without the assistance. It contributes to the non-farm economy in the districts, not only as buyers of inputs and sellers of farm products, but as laborers and wage or salaried workers in the community.

Payments, target market price, and other farm programs have been designed to encourage livestock production in the less favorable farming areas and to encourage grain and crop production in the favorable farming districts.<sup>11</sup> Cereal prices have been set at high levels relative to livestock prices so

<sup>10</sup>Overview of Norwegian Agriculture and Agricultural Policy," op. cit. p. 2.

<sup>11</sup>Seljegard, Steinar, "Agricultural Policy in Norway," Report for the Special Committee for the Protection of the Environment, Norges Bondelag, Oslo, Norway, September, 1989, pp. 5 & 8.

that farmers are encouraged to produce grain in the three favorable flatland agricultural districts. This reduces the potential for surplus production of animal products and increases self-sufficiency in grain production. This strategy is known as the 'canalization policy'.

The high level of farm support is achieved without all costs being transferred to consumers. Much of the support has been achieved through income transfers. Consequently, in recent years about 60 percent of the agriculture income is received through market prices and 40 percent through subsidies. The income transfers not only limit market impacts of the policies, but they permit more targeting of assistance programs.

The farm programs translate into high retail food prices. The prices in Table 6 were collected for several common food items from one retail outlet each in the U.S. and Norway during Fall 1989. Both are prices from supermarkets. Though no statistical reliability can be attached, I believe they represent prices which are commonly paid in both countries. The Norwegian price was converted to dollars using the December 12, 1989 exchange rate. None of the items selected was priced at a lower level in Norway than in the U.S. Dairy products appear to be nearest the retail price levels in the U.S. This is an item for which the processors are paid a subsidy in order to reduce the price charged to retailers and the final consumer. Meat and egg prices are two to five times U.S. prices for equivalent products. My impression from living in Norway during Fall 1989 is that a typical U.S. food market basket would cost 2 to 3 times the U.S. cost in Norway.

The high retail food prices, as would be expected, mean a higher per capita share of food expenditures of consumer incomes and result in a different composition of the food market basket than in the U.S. In 1987, Norwegians spent an average of 20 percent of their income on food. The corresponding figure in the U.S is 14 percent which includes a much higher proportion of food away from home. Meat consumption is half that of the U.S. and poultry meat is one tenth the U.S. level, see Table 7. Beef and poultry meat are 37 percent and 13 percent respectively of the levels in the U.S.



Table 6. Comparisons of Retail Food Prices, Norway and the U.S. 1989<sup>a/</sup>

ITEM	U.S. Units	U.S. Price	Norway Price	Ratio U.S./Norway
-- -dollars- --				
Tomato puree	6 oz	.39	1.10	2.82
Wheat flour	10 lbs	1.49	3.32	2.23
Spaghetti	lb	1.05	1.11	1.06
Corn flakes	12 oz	1.49	2.26	1.52
Sugar	10 lbs	2.99	6.35	2.12
Turkey (frozen)	lb	.98	3.15	3.21
Chicken	lb	.78	2.21	2.83
Wiener	lb	2.29	4.58	2.00
Rolled roast beef	lb	2.38	6.11	2.57
Pork chops	lb	1.38	4.02	2.91
Ground beef	lb	1.28	5.72	4.47
Round steak	lb	2.48	12.59	5.08
Butter	lb	1.25	1.70	1.36
Norvegia/colby cheese	lb	2.69	3.71	1.38
Whole milk	1/2 gal	1.27	1.73	1.36
Skim milk	1/2 gal	1.15	1.46	1.15
Cream	1/2 pt	.79	1.19	1.51
Ice cream	5 qts	3.87	9.73	2.51
Soft margarine	lb	1.33	1.36	1.02
Eggs (large)	doz.	.88	3.29	3.74

<sup>a/</sup>U.S. prices collected from a St. Paul Minnesota supermarket in December 1989. Norwegian prices collected from a Steinkjer Norway supermarket in November 1989. Conversions made on December 11, 1989 kroner/dollar exchange rate.

Table 7. Annual per Capita Consumption of Animal Products, Norway and the U.S. 1987

	Norway	U.S.
kgm/capita		
Beef	18.2	49.5
Pork	20.9	30.2
Poultry meat	3.7	30.4
Eggs	13.0	15.4
Beverage milk	164.7	96.9
Yogurt	4.2	2.1
Cheese	13.5	10.9
Cream	4.5	2.1

## Conclusions

Norwegian agricultural policy is an extensive and intricate system of regulation of agricultural prices and production. It leads to very high costs of support and high incomes per farm worker. This is impressive, but what is more significant are the methods of clearly defining income targets for the sector, the mechanisms to achieve those targets without the high potential for programs benefits being directly related to size of farm and sales volume, and using agriculture programs to maintain and stimulate the economies of rural areas. It achieves incomes by a combination of support of market price and by income transfers that rapidly decline with volume of sales. Regional price differentials and subsidy differentials are also structured to maintain agriculture in less favored areas.

Although U.S. agricultural policy has traditionally incorporated maintenance of the family farm and saving rural communities as objectives, the support mechanisms have usually had the opposite effect. Much of the income support is channelled through market price, consequently, amount of benefits increase directly with volume of sales. Limits on income transfers (deficiency payments) per farm are very high and can often be avoided. Though the Norwegian model has problems, it also provides us with some examples for designing farm programs.