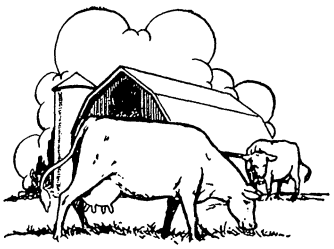

MINNESOTA
farm business
NOTES

NO. 336 UNIVERSITY FARM, ST. PAUL MARCH 31, 1952

Hog By-Product Credit System Is Studied

A. G. Wilson and A. A. Dowell

What is wrong with our present system of marketing hogs? The answer is plain. Butcher hogs are now sold in the United States by live weight, with little or no sorting or pricing on the basis of quality. This is a failure to reflect back to hog producers the preference of consumers for lean cuts.

The situation seems to be due, in part at least, to the inability even of experienced buyers and sellers to estimate accurately the yield, grade, and hence cut-out value of an individual hog or individual farmer's lot of hogs. This has led to widespread interest in marketing slaughter hogs by carcass weight and grade as has been done for many years in Denmark, Holland, Sweden, the United Kingdom, Canada, and a few other countries.

Studies Yield Carcass Standards

Studies have been made by the Minnesota Agricultural Experiment Station in cooperation with the United States Department of Agriculture and Geo. A. Hormel & Co., meat packers, Austin, Minnesota. These investigations have shown that with average backfat thickness and carcass weight known, it is possible to estimate the yield of wholesale cuts and hence value of individual carcasses with considerable accuracy. Based on these findings, carcass grade specifications have been developed and reported in Minnesota Agricultural Experiment Station Technical Bulletin 187, *Marketing Slaughter Hogs by Carcass Weight and Grade*. Similar studies are being carried on in several states as part of a regional project sponsored by the North Central Livestock Marketing Research Committee.

One problem which arises in the adoption of the carcass weight and grade method of marketing is the determination of by-product credits. In countries where this method of marketing is used, payment is made to hog producers on the basis of the weight and grade of carcasses dressed "shipper" style. The shipper carcass is the entire body of the hog without blood, hair, and viscera.

U. S. Uses Packer Carcass

In the United States the typical carcass is dressed "packer" style. The packer carcass differs from the shipper carcass in that the head, leaf fat, kidneys, and ham facings are removed as well as the blood, hair, and viscera. Consequently, if payment is to be based on the weight and grade of the packer carcass the price must be adjusted to include the value of these items.

This problem led to a study to find the most practical method of determining by-product credits. Obviously the exact by-product credit for an individual hog or for an individual farmer's lot of hogs can be determined only by cut-out tests. The various by-products must then be weighed, priced, and their true value determined. But this does not appear to be practical in a typical packing plant, for it reduces efficiency.

Table 1. Average Relationship of Packer Carcass Weight, Total By-Product Weight, and Shipper Carcass Weight, 246 Hogs

Packer carcass weight	Total by-product weight*	Total by-product weight as a percentage of packer carcass weight	Shipper carcass weight*
pounds	pounds	per cent	pounds
115	14.0	12.2	129.0
125	14.8	11.9	139.8
135	15.7	11.6	150.7
145	16.5	11.4	161.5
155	17.3	11.2	172.3
165	18.1	11.0	183.1
175	18.9	10.8	193.9
185	19.8	10.7	204.8

* Includes head, leaf fat, ham facings, and kidneys.

Since backfat thickness and carcass weight were known to indicate carcass merit fairly accurately, it was decided to see whether these measures might not also be used in determining by-product credits.

A sample of 246 hogs was used for the analyses. The apparent breed of each hog was recorded before the animals were slaughtered. Weights were taken of the head, leaf fat, kidneys, and ham facings as they were removed from the carcass. The weight of the carcass also was taken after these by-products had been removed, and the thickness of backfat was measured at three points along the back.

Weights Compared

The first step in the analysis was to relate the combined weight of the by-products—head, leaf fat, ham facings, and kidneys—to packer carcass weights.

Total by-product weight was found to increase steadily with carcass weight. For example, as shown in column 2 of table 1, the weight of the by-products removed from packer carcasses weighing 115 pounds was approximately 14 pounds, while from 165-pound carcasses the combined weight of the by-products was slightly over 18 pounds.

But the increase in combined by-product weight was not proportional to the increase in carcass weight. As shown in column 3 of table 1, the combined weight of the by-products was slightly more than 12 per cent of the weight of 115-pound packer-dressed carcasses, but slightly less than 11 per cent of the 165-pound carcasses.

The relationship between total by-product weight and carcass weight was found to be quite close. This suggests that the combined weight of the four by-products can be estimated quite accurately if the weight of the packer-dressed carcass is known. It does not follow, however, that the combined

MINNESOTA
farm business
NOTES

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value of the by-products can be determined with equal accuracy. This depends on how accurately the weight of each by-product can be estimated from carcass weights.

The next step, therefore, was to relate individual by-product weights to the packer carcass weight. The relationships were not close enough to give a satisfactory estimate of the individual by-product weights. Consequently this method did not serve as a basis for an accurate estimate of by-product credits.

Increase in Backfat Thickness Produces Other Changes

The next step was to find whether the lack of relationship between individual by-product weight and carcass weight was caused by variation in average backfat thickness. In this part of the study the individual by-product weight was related to backfat thickness within the various weight groups.

Here it was found on the average that as backfat thickness increased the following things happened: the weight of the leaf fat increased sharply, the weight of the ham facings increased slightly, the weight of the head and kidneys decreased slightly (table 2), and the combined weight of the by-products increased slightly.

However, these relationships were not close enough to permit an accurate estimate of individual by-product weight based on backfat thickness. Consequently this method could not be used as an accurate determiner of by-product credit for the hogs used in this study.

The close relationships expected among by-product weight, carcass weight, and backfat thickness were not found. This led to an inquiry into possible causes of the variations. A test for differences among breeds was possible for two of the breeds used in this study. While the results are not conclusive they suggest that differences exist among breeds in weight of by-products from carcasses of the same weight.

Observation of packing house operations during the study suggests that part of the variation in weight of by-products was due to variations in cutting within the plant. The head is removed in such a manner as to leave as much skull and jowl meat on the carcass as possible. Ham facings are removed from the edge of the hams, leaving the lean meat exposed. The removal of these parts and possibly also that of leaf fat is subject to considerable variation even if done the same day by the same man.

Other possible causes which were suggested but not covered in the study include the sex of the hog, kind of feed, and rate of growth from birth to time of slaughter.

In countries where the carcass weight and grade method of marketing has been adopted it has led to greater uniformity in the kind of hogs marketed. There is no reason to believe that the results would be different if this method of marketing were adopted in this country. If so, the relationship among by-product weight, carcass weight, and backfat thickness could be expected to be closer. Even so, the problem of cutting variations would remain.

Shipper Basis Fair to Producers

This leads to the conclusion that if the carcass weight and grade method of marketing hogs is adopted it would be more fair to producers to pay on the basis of shipper carcass weight.

It would be necessary to weigh the carcass on the rail before the head, leaf fat, ham facings, and kidneys were removed. This could be accomplished with automatic recording scales and should not interfere with the progress of the carcasses along the rail. Carcass grade standards already established could be readily adapted to shipper carcass weights since the weights of the two are closely related.

Table 2. Average Relationship of By-Product Weight and Average Backfat Thickness, 57 Hogs, 145- to 155-Pound Packer Carcass Weight Group

By-product	Average backfat thickness in inches					
	1	1¼	1½	1¾	2	2¼
	pounds					
Head	11.01	10.70	10.38	10.07	9.75	9.44
Leaf fat	3.18	3.83	4.47	5.12	5.76	6.41
Ham facings	1.16	1.16	1.16	1.16	1.16	1.17
Kidneys	.66	.63	.60	.57	.54	.51
Total	16.01	16.32	16.61	16.92	17.21	17.53

Loose Housing Barn Saves Chore Time

Niels Rorholm and S. A. Engene

How much labor does it take to do the chores in a loose housing barn? To help answer this common question from farmers, labor records have been kept at the loose housing barn at the Rosemount Research Center of the University of Minnesota. The herdsman kept a simple labor record for each day for a full year, and detailed stop watch timings were made one day a month.

The number of hours of man labor used for each cow in the milking herd is shown in the accompanying table. These data are for only one barn and for a herd kept under unusual circumstances; they cannot be considered typical of all loose housing barns. Data obtained from seven dairy farms in Nicollet County with conventional stanchion barns in 1944-45 provide a rough basis for comparison.

Man Hours per Cow per Year

	Rosemount loose housing barn	Conventional barns
Milking	44	55
Care of milk, equipment, and milk house	34	22
Feeding grain	5	5
Feeding silage	7	8
Feeding hay	5	8
Bedding, sweeping	7	4
Cleaning milking parlor	9	18
Cleaning feeding area	12	
Hauling manure to field	6	10
Miscellaneous	8	14
TOTAL	137	145

Milking and the care of milk and milking equipment took half of the total chore time. The use of the milking parlor and fast milking techniques made it possible to do the milking in less time than in the conventional barns. This shorter time was possible in spite of the fact that at the Rosemount loose housing barn the milk from each cow was weighed and recorded separately, while no weighing was done on the other farms. Greater care was also given to washing udders and teat cups.

Care of milk, milking equipment, and milk room took almost as much time as milking. Great care was used to assure the cleanliness needed to produce low bacteria milk at Rosemount. Differences in this job between the Rosemount and the Nicollet County farms is due largely

to arrangement of the milk house, methods of working, and nature of the work; the job is not likely to be affected by the barn arrangement.

Feeding and bedding took only a small part of the chore time. In the loose housing barn the cows were fed grain when they were milked; each cow was fed according to production, with the grain being weighed. Silage was pushed to the feed bunk in a cart, as it would be fed in a stanchion barn. Baled hay was stored on the ground floor, directly in front of the manger. The bales were opened and dropped into the mangers twice a day.

Cleaning and hauling manure took about one-fifth of the chore time. Most of the manure from the loafing area was hauled out in the spring, using a tractor-mounted loader and tractor-drawn spreaders.[1]

However, twice as much time was used in cleaning the feeding area. The hay and silage bunks were set on a concrete slab and no bedding was used. This area was cleaned every day or so. Cleaning the milking parlor also took a considerable amount of time but gave a much cleaner milking area.

These data give some ideas for loose housing barns. Milking and caring for the milk are the most time-consuming jobs; these should receive the major attention in the plans. Cleaning and manure hauling can easily be the second biggest time consumers. Arrangements that eliminate or reduce daily cleaning are desirable. Feeding is a smaller job, but is big enough to deserve considerable attention.

[1] See *Farm Business Notes*, No. 332, September 1951. "Saving Time with Small Crews" by Niels Rorholm and S. A. Engene.

Revolving Plan Is Helping Cooperatives

E. Fred Koller

The revolving capital plan of financing is being used extensively by farmers' marketing and purchasing cooperatives in Minnesota. The recent survey made by the Division of Agricultural Economics of the University of Minnesota showed that 602—about 45 per cent of the 1,341 associations in the state—had adopted the plan.

The year-end balances in all of the revolving capital accounts in these associations totalled $75,466,000. This was equal to about 53 per cent of their members' equities, or net worth, which totalled $141,150,000. Balances in the revolving accounts of the local cooperatives averaged $56,174 per association, while those of the large regional associations averaged $4,221,150 (see table).

Use of Revolving Capital Plans by Minnesota Cooperatives Classified by Major Commodity Type, Fiscal Year 1949-50

Major commodity type	Number of associations reporting	Number of associations using revolving plans	Number of capital accounts revolved	Year-end balances in revolving accounts	
				Total all associations	Average per association
				thousand dollars	dollars
LOCAL ASSOCIATIONS					
Mixed dairy	19	16	17	1,022	63,844
Butter	433	237	246	12,597	53,151
Milk and cream	66	35	37	4,396	125,614
Cheese	16	6	7	1,002	166,933
Total dairy	534	294	307	19,017	64,681
Fruits and vegetables	12	5	6	701	140,300
Grain	231	133	136	5,440	40,904
Livestock	184	2	2	14	6,850
Poultry and eggs	36	18	18	727	40,394
Miscellaneous products	2	1	1	13	13,300
Total marketing	999	453	470	25,912	57,201
Mixed supplies	6	3	3	172	57,500
Petroleum products	162	76	80	4,002	52,656
Production supplies	40	9	10	595	66,133
General merchandise	86	42	43	1,931	45,971
Total supplies	294	130	136	6,700	51,542
Service	33	9	11	643	71,378
TOTAL LOCAL	1,326	592	617	33,255	56,174
REGIONAL ASSOCIATIONS	15	10	12	42,211	4,221,150
GRAND TOTAL	1,341	602	629	75,466	125,359

Process Is Continuous

Under this plan annual additions to capital are obtained from the patrons by keeping patronage refunds in the business or by some other means. These additions are continued until capital has reached a desired level. Then the oldest capital increments are returned to the patrons each year at the same time that new additions are obtained.

It was found that the revolving plan was being used by cooperatives of all major commodity types (see table).

The 602 associations with revolving plans accounted for 629 capital accounts since some associations had more than one account on this plan. Patrons' equity reserves (book credits) were on a revolving basis in 452 cases, common stock in 108 cases, preferred stock in 47, and various types of certificates of equity in 22.

The plans varied considerably in length of revolving period—the length of time before repayment. In 19 cases the revolving period was fixed in advance for a definite number of years, but in 610 cases the length of the period was left to the discretion of the board of directors. In 346 plans which had reached the repayment stage, 127 had a revolving period of less than five years and 302 had a period of ten years or less. Too long a revolving period may cause members to lose faith in the plan.

In using the revolving plan some associations pay dividends or interest on the capital revolved while others do not. In 169 cases such payments were made, while no payments were made in 460 cases.

The revolving plan has many advantages. Patrons help finance the association in proportion to the use they make of it and in installments which usually are not burdensome. Also, current patrons carry most of the financial load, enabling the association to repay the equities of those who are no longer farming in the community or are deceased.

The plan also provides a method whereby cooperatives can obtain necessary amounts of owners' equities, or risk capital. This study included innumerable cases in which cooperatives, both large and small, had materially improved their financial position with the aid of this plan.

Minnesota Farm Prices, Jan.-Feb., 1952

Prepared by Jerry M. Law

Average Farm Prices for Minnesota, January and February 1952, with Comparisons*

	Jan. 1952	Jan. 1951	Feb. 1952	Feb. 1951
Wheat	$ 2.19	$ 2.15	$ 2.15	$ 2.28
Corn	1.30	1.43	1.30	1.48
Oats	.87	.83	.81	.87
Barley	1.34	1.44	1.26	1.47
Rye	1.72	1.54	1.62	1.65
Flax	4.28	4.31	3.96	4.56
Potatoes	1.85	.85	1.95	.90
Hay	16.10	15.40	15.60	15.70
Hogs	16.90	19.90	16.70	22.20
Cattle	26.70	26.60	27.00	28.50
Calves	31.20	31.20	31.90	33.20
Lambs-sheep	26.89	29.72	25.92	32.64
Chickens	.184	.179	.202	.214
Eggs	.310	.317	.278	.348
Butterfat	.86	.75	.89	.75
Milk	4.05	3.55	4.10	3.60
Wool†	.57	.80	.48	.95

* Average prices as reported by the USDA.

† Not included in the price index numbers given below for Minnesota.

The index of Minnesota farm prices represents the average of the increases and decreases in farm product prices in the given month of 1952 over the average of the five corresponding months of the period 1935-39. Weights for Minnesota indexes are the average sales in the five corresponding months of 1935-39. Weights for the U. S. indexes are average sales of 60 months in 1935-39.

Prices received by Minnesota farmers for major agricultural commodities averaged lower in February than a month earlier. Largest percentage declines were for eggs, flax, and oats. Chickens showed the greatest increase. Except for potatoes, butterfat, and milk, prices were below February 1951.

The Outlook Corner — Soybean Production

Soybean production has experienced unusual growth during recent years. The trend has been associated with quite stable yields and an expanding market. An industry has been built especially tailored for this crop. These developments have created a form of permanence, with most producers now primarily concerned about a saturation point. Soybeans are grown principally for edible oil and meal.

The important trends of the last twelve years relate to production and processing, consumption rates of edible fats, exports, and prices. These are reviewed briefly as follows:

Production Triples — The following table indicates total production has more than tripled since 1940. The largest production to date was reached in 1950.

Soybeans: Production, Crushings, and Exports

Year beginning Oct.	Production for beans	Crushings	Exports*
	million bushels		
1940	78	64	2
1941	107	77	3
1942	188	133	6
1943	190	142	7
1944	192	153	12
1945	192	159	11
1946	201	170	13
1947	184	161	16
1948	223	184	54
1949	231	195	43
1950	287	245†	67†
1951	276	225‡	.....

* Exports include oil converted to bushels of soybeans.

† Partly estimated.

‡ Estimated.

Consumption Up—The annual consumption of fats per person doesn't vary much. In the last 20 years the average has varied only from 41 to 45.

The change in composition of edible fats consumed, however, is more significant. Here one finds that in 20 years the source of edible fats consumed has changed from 32 per cent of vegetable origin to approximately 50 per cent.

In this same period the soybean oil content of some margarines and cooking fats has changed from slightly more than a trace to over 50 per cent. And soybean oil made up nearly one-fourth of the total edible fats and oils produced in this country in 1950.

Exports Climb—Soybeans and soybean oil were exported in large volume in recent years (see table). With supplies from traditional Far Eastern sources still unavailable to world markets, exports from this country have gone up. There is some evidence, however, that Manchuria may soon become a competitor again.

Acreage Goal and Price Support Announced—The acreage goal announced by the Production and Marketing Administration calls for a one per cent reduction from 1951. The support price was announced February 11 at a fixed level of $2.56 a bushel—90 per cent of parity as of November 15, 1951.

If soybean production expanded beyond the goal announced and if exports declined, a burdensome supply could result.

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Cooperative Extension Work in Agriculture and Home Economics, University of Minnesota, Agricultural Extension Service and United States Department of Agriculture Cooperating, Paul E. Miller, Director. Published in furtherance of Agricultural Extension Acts of May 8 and June 30, 1914.

Indexes and Ratios for Minnesota Agriculture

	Jan. 15, 1952	Average, Jan. 1935-39	Feb. 15, 1952	Average, Feb. 1935-39
U. S. farm price index	276.2	100	264.7	100
Minnesota farm price index	267.9	100	270.8	100
Minn. crop price index	233.0	100	242.7	100
Minn. livestock price index	300.7	100	305.3	100
Minn. livestock products price index	234.8	100	242.5	100
Purchasing power of farm products				
U.S.	120.5	100	115.1	100
Minn.	116.9	100	117.7	100
Minn. farmers' share of consumers' food dollar	58.8*	48.4	58.8†	48.0
U.S. hog-corn ratio	10.4	12.7	10.4	13.1
Minn. hog-corn ratio	13.0	14.9	12.9	15.5
Minn. beef-corn ratio	20.5	11.7	20.8	12.1
Minn. egg-grain ratio	10.5	15.0	9.7	14.4
Minn. butterfat-farm-grain ratio	32.6	33.9	35.6	34.2

* Figure for November 1951. † Figure for December 1951.

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