SWINE PRODUCTION

▪ ECONOMICS

CANADA DEPARTMENT OF AGRICULTURE
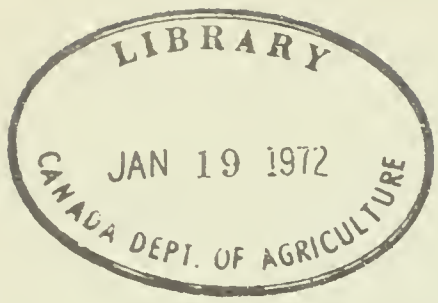
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■ ECONOMICS

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NOTE TO READERS

The attention of readers is drawn to the fact that the text for this publication was prepared by the Saskatchewan Advisory Committee on Swine Production and that where recommendations for pesticide use appear, they are consistent with those of that province. However, readers who reside in other provinces should check with provincial authorities to determine whether or not the recommendations apply in their province.

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HOGS CAN BE PROFITABLE

A swine enterprise can be a profitable venture. As in any business, to make the most profit, the operator must have a sound knowledge of basic economic and production principles. Lack of planning or careless management of the swine enterprise, as of any business, can end in financial loss.

A person contemplating a hog production enterprise should carefully consider the following questions:
- With the experience and resources available, could I maintain a profitable hog enterprise?
- What size enterprise can I handle most efficiently and profitably?
- Which type of hog production, i.e., weanling, feeder, farrow-finish, breeding, would be most suitable?
- Should I use conventional or mechanized facilities?
- Why are some swine enterprises successful while others are not?

Each farmer must assess the answers to these questions as they relate to his own situation. The best method of operation or type of production for one farmer may not be the best for his neighbor. It is easy to be optimistic about expected hog prices and performance levels, and the new producer should make a critical comparison of his management with that of this neighbors who have been successful.

Marketing grain through hogs

The profitability of marketing grain through hogs depends on four factors:
- the price of pork
- the feed conversion ratio
- the price of feed grains
- the overall management of the hog enterprise

Table 1 indicates the amount of grain that might be marketed through hogs in various types of enterprises. Higher consumption of grain can result from such factors as poor housing, poor disease control and poorly balanced rations.

Table 1. Amount of Grain (Barley) Marketed through a Hog

Type of Enterprise	Feed Required (Barley)	
	lb	bu
Feeder hogs[1] (35-200 lb)	465-560	9.7-11.6 per hog marketed
Farrow-finish	600-750	12.5-15.7 per hog marketed
Weanling pigs	1900-2280	40.0-47.5 per breeding female per litter

[1] Ranges for feeder hogs are for feed conversions of 3.25:1 and 4.0:1 whereas the high requirements for mature stock are increased by 20 percent.

Mechanized vs conventional facilities

The operator of a swine enterprise must decide which facilities are best suited to his needs: mechanized, total confinement buildings with controlled temperature and humidity, or conventional facilities in which temperature and humidity are not controlled, animals are allowed outside, and such tasks as feeding and manure removal are done, at least in part, by hand.

Mechanized facilities can best be employed when the producer:
- has access to adequate capital but no surplus labor
- has experience with hogs and a high level of skill in working with them
- is prepared for a long-term commitment to hog production
- wants to make hogs a primary enterprise with a high volume of production
  Conventional facilities are most suited to the producer who:
- has sufficient labor but is short of cash
- has limited experience dealing with a hog enterprise
- is not prepared for a long-term hog production enterprise

The trend in swine production is toward greater confinement, particularly when the producer wants a large scale operation and must therefore minimize his labor requirements. Greater confinement leads to lower feed requirements per hog, easier handling and management of the breeding herd, and a shorter time period in which to grow hogs to market weight. However, mechanized enterprises require more careful management for top economic performance than do conventional ones. High capital investment for mechanized facilities *does not* serve as a substitute for day-to-day management skills.

While controlling temperature and humidity is difficult without modern facilities, the proper insulation and ventilation of conventional buildings seldom requires a prohibitive expenditure and can improve production performance in non-mechanized facilities.

Size of enterprise

Good management is the key to low per unit production costs and thus higher profits.

Manual feed and manure handling systems limit the number of hogs that can be handled efficiently and profitably. A large number of hogs can be handled in mechanized facilities. However, high income can be achieved from conventional facilities and a medium-size enterprise, even though there will be high labor requirements per unit of production.

The best combination for highest income is good management (low production costs) and mechanized facilities (high number of hogs).

Selecting the type of enterprise

There are four types of hog enterprise: weanling, feeder, farrow-finish and breeding stock. Table 2 shows the resources required for the various types of swine enterprise.

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Table 2. Resources Required For Various Types of Swine Enterprises

Weanlings	Feeders	Farrow-finish	Breeding stock
1. A high level of skills for: (a) Managing the herd breeding and farrowing schedules (b) Farrowing and rearing piglets (c) Disease control 2. Warm, dry farrowing facilities 3. High labor required in relation to capital 4. Low grain requirement in relation to labor and capital	1. Reasonable skill for: (a) Providing proper rations to get good feed efficiency (b) Disease control (c) Purchasing weanlings with good profit potential 2. High grain requirement in relation to labor and capital 3. Low labor requirement (if the facilities are highly mechanized)	1. A combination of the skills required for the previous two types of enterprises 2. A medium amount of capital in relation to labor and grain requirements	1. All the skills required for the other types of enterprises 2. Ability to maintain and assess detailed and and accurate records of pig performance 3. Knowledge of breeding procedures 4. Greater capital investment than any type of commercial swine enterprise

SUPERIOR PHYSICAL PRODUCTION PERFORMANCE

Few producers reach top levels of physical production performance in their hog enterprise. Average performance is well below the levels of "superior performance". Producers with poor breeding stock, or who do not crossbreed, should expect lower levels of physical production performance.

Likewise, producers with conventional facilities which are cold, wet or unsanitary cannot expect superior physical performance. Inexperienced producers, even though they might have expensive facilities, should not expect superior physical production performance immediately.

Low feed conversion

Balanced rations, minimal disease levels and hybrid pigs can achieve feed conversions of less than 3 pounds of feed per pound of gain in the growing and finishing periods. Feed requirements based on average conversions of 3.25:1 for growing animals are given in Table 3. Given good performing breeding stock and disease control, it is possible to reduce this feed requirement by as much as 15 per cent.

High productivity per sow

Superior breeding stock, proper nutrition and close attention at farrowing time, are necessary for superior performance in terms of animals produced on a per sow basis.

An individual sow can have as many as 2.55 litters in a year (three litters every 14 months). A superior sow could therefore farrow 22–23 pigs in a year although it would be difficult to wean more than a maximum of 18–19. This might allow for sales of 17–19 market hogs per year from this high producing sow.

Not all sows in the breeding herd will reach this level of performance. Because some sows have poor or no litters, others are culled and new gilts are brought in, *the average performance per sow in the superior breeding herd* will not likely be this high.[1]

An overall breeding efficiency of 85 percent would result in 15–16 market hogs sold per year for each sow in the breeding herd. This number of annual market hogs represents a level of performance which is achieved by relatively few herds.

Other factors related to superior physical performance

Healthy, fast-growing pigs can be reared to market weight in 150–180 days.

Minimum days to market weight depends heavily on freedom from disease. Proper nutrition also increases resistance to disease. Superior management in terms of getting hogs to market in 5 to 6 months is therefore closely related to the question of *proper nutrition* and *disease control*.

The problem of least cost rations

Although "properly balanced" rations may result in the best physical feed conversion, there may be other rations which would achieve a lower feed cost per pound of pig produced on the farm. Some grains are higher in nutrients, and it may be possible to lower feed costs by feeding more grain and less supplement in the ration.

It is important to know whether a "cheaper ration" will actually cost less in terms of cost per pound of pig produced. Rations which are "inexpensive" may be short of essential nutrients and therefore inefficient.

The lowest cost of feed per pound of gain is one of several important economic factors. Each individual farmer should recognize that the least cost ration formulation on his farm depends on:
- The value of feed grain on the farm
- The price of supplements
- The nutrient content of feed grain
- The feed requirements of the animals for good growth and good health

The kinds and proportions of feeds used for the most economical production varies with such factors as price, nutrient content and feed requirements. Table 3 provides an estimate of feed costs for various classes of swine.

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[1] If a sow is on the farm for 12 months, she should be counted as one sow unit, and one-half sow unit if she is present for 6 months, etc. The total sow units should be used for these purposes and not just the sows which have good litters twice per year.

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Table 3. Feed Requirements and Costs for Various Classes of Swine[1]

Class or period	Ration constituent (lb)		(lb)	Total feed required (lb)	Total cost (dollars)	Feed cost per market hog (dollars)
	Prestarter	Starter				
Weanling (up to 35 lb)	16	18	34	2.50		2.50
	Barley	Supplement				
Weanling (35-50 lb)	23	5	28	0.70		
Grower (50-110 lb)	150	28	178	4.21		
Finisher (110-200 lb)	290	40	330	7.15		12.06
Sow (per year)	1900	200	2100	42.50		2.83[2]
Boar (per year)	1520	180	1700	35.40		0.12[3]
Total						17.51

[1]Assumptions: (1) Total confinement
     (2) High energy grain (12-14% protein barley), valued at 1.5¢ per pound
     (3) 35-40% protein-mineral-vitamin supplement valued at 7¢ per pound
     (4) Prestarter and starter are complete commercial feeds, valued at 10¢ and 5¢ per pound, respectively
[2]   (5) 15 pigs produced per sow per year
[3]   (6) Mating ratio of one boar per 20 sows

productivity of the breeding herd

High productivity per sow is usually consistent with higher profits per sow. Controlled temperature and humidity are required for superior performance in this respect. However, higher capital investment is required to achieve this ideal environment. Breeding herd performance must be better to compensate for higher investment costs.

Sow productivity depends heavily on management of the sows with respect to breeding schedules and care at farrowing time. Superior performance requires superior management even when housing conditions are ideal.

age (days) to market weight

Minimum days to market weight and high yearly turnover are usually consistent with economic efficiency if investment in buildings and equipment is high.

If investment is low, and labor and facilities are plentiful, it may be economical to accept longer times to market weight. Hogs which take as long as 7 or 8 months to reach market weight require additional labor and will likely require an

uneconomical feed conversion ratio. The money invested in the hog will also be tied up for a longer period.

Another factor which influences the time to market weight is the weight at which the hogs are sold. It takes more feed to produce a pound of pork as the hog reaches heavier weights. Seven to eight percent more feed per pound of pork is required for a hog weighing 200–255 pounds than for one weighing from 150–200 pounds.

If, for example, the feed conversion ratio from 150–200 pounds is 3.5:1, and from 200–225 pounds is 3.75:1, and the ration is worth 2 cents per pound, the extra feed cost would be about $1.90 per hog.

Other facts to consider are:
- Probable loss in index rating
- Additional labor and overhead costs
- Probable reduction in turnover (i.e. less pigs through the barn)

A farmer who has a considerable investment in the hog enterprise must look upon turnover as an important factor. Table 4 shows how significant turnover can be.

Table 4: Effect of Turnover on Labor Return [1]

	Number of hogs fed per year	
	700	800
	($)	($)
Investment	17,500.00	17,500.00
Operating costs per hog	32.00	32.00
Fixed costs per hog	3.04	2.66
Labor return per hog	6.96	7.34
Enterprise labor return	4,872.00	5,872.00

[1] Assuming greater use of facilities with no change in per hog operating costs and gross returns, and hours of labor.

The net effect of feeding an extra 100 hogs through the same facilities is to increase labor returns by about 20 percent. Such an increase in turnover is possible by reducing the average time to market weight from 180 days to 154 days per market hog.

Variation in performance and costs from farm to farm

Wide differences in production performance and costs from one farm to another may be attributed to the following factors:
- Dissimilar experience and day-to-day management skills, especially with regard to disease control
- The quality of the breeding herd
- The type of facilities used

The question, "How much does it cost to raise hogs?", can only be answered in terms of each individual situation. It is easy to be too optimistic about the expected level of physical performance, and a producer should make a critical comparison of his management with those who have been successful operators for some time.

PROCEDURES FOR ESTIMATING PRODUCTION COSTS

Producers should keep records of such items as the cost and amount of feed consumed, the number of animals farrowed and weaned or purchased, the cost of purchased animals, the number marketed, and their price, and the breeding and farrowing dates for individual sows. Such records are essential in gauging day-to-day management, as a basis of year-to-year comparison, and as a check on efforts to improve performance.

Out-of-pocket expenses

Some production costs involve an out-of-pocket expense while others do not. The out-of-pocket expenses are simply recorded as cash outlays and include such items as purchased feed, hired labor, veterinary and medicine costs, utilities and miscellaneous overhead, insurance on facilities or livestock, repayment of loans, machinery and equipment operating costs, repairs to buildings and equipment, and purchased replacements for the breeding herd.

Opportunity costs

Costs which do not involve cash outlays are usually termed opportunity costs and may include such items as homegrown feed, the farmer's labor, buildings and equipment owned by the farmer, breeding herd replacements selected from farm stock, and money generated on the farm and used for operating expenses.

The real cost of inputs, which do not require cash outlay, is the income they would have produced if they wre not used in the hog enterprise. For example, if homegrown barley can be sold for 1 cent per pound, then this is its real cost to the hog enterprise. The best alternate income from the barley might be to sell it for this price to another hog producer.

If the farmer's labor could have been used for another alternative such as cattle or carpentry, the real cost of his labor to the hog enterprise is the hourly wage he sacrifices.

If farm buildings could be used for other enterprises, the real cost of the buildings to the hog enterprise is the return which would be earned if the buildings were used in another way. Assuming the buildings would be idle if there were no pigs, then there is no "opportunity cost" and the real cost of the buildings to the swine enterprise approaches zero. If there are loan payments to make on the buildings, the relevant cost might be the cash outlay required to service the loan.

If money generated from the farm is used for hog operating expenses, rather than put in the bank or used for some other purpose, then the real cost of operating capital to the hog enterprise is the rate of return which would have been earned in the best alternate use. The real cost of borrowed money is simply a cash outlay in terms of interest.

If a gilt is selected from the farm stock to replace an older sow, the real cost of the replacement is the return given up by not selling the gilt.

Variable costs

Some cost items vary with the level of production and can be changed by decisions which affect the level of current production. These cost items, called variable costs, include feed, labor, veterinary and medicine charges, livestock insurance, utilities and miscellaneous overhead, machinery and equipment operating costs, repairs to buildings and equipment, interest on money used for operating expenses and loss allowance due to the death of hogs prior to reaching full market weight.

Fixed costs

Some cost items, the result of long-term planning, are not influenced by day-to-day decisions. Called fixed costs, these include loan payments, interest on owned investment, breeding herd replacements and depreciation due to obsolescence.

Using cost figures for decision-making

Variable costs influence short-run decisions regarding when, how and how much to produce. The fixed costs do not vary in the short run because they will remain constant even if no production takes place. The length of time to which decisions are directed determines whether variable costs or total costs are the most important factors bearing on production decisions.

For example, a farmer may be testing out some plans to build a hog barn. He would not go ahead with the enterprise unless he expected the eventual returns to cover his total costs (cash costs, interest and depreciation, etc.). Total costs (variable plus fixed costs) are the relevant costs for him to consider.

If the farmer already has the facilities, he has already accepted the fixed costs that go with them. This means that he bears the fixed costs whether he uses the facilities or not. The farmer should, therefore, produce as long as the returns cover the variable costs associated with production since it is only the variable costs that are due to actual production.

Break-even points for pricing weanlings

Weanling producers are always in a strong bargaining position when there are good profits in feeding operations. Cost records can be used by weanling producers to develop pricing guidelines as an aid in bargaining with feeder operations.

Farmer's Estimate of Production Cost/Weanling	$12
Add Desired Labor Return	4
Break-Even Selling Price for Weanling Producer	$16

Feeder operators can also use cost records to estimate break-even weanling costs. Table 5 illustrates the procedure when a $4 labor return is desired by the feeder operation.

Table 5. Break-even Weanling Costs for a $4 Labor Return
(Select the Cost Column and the price row that is the most reasonable expectation for your situation.)

Expected Returns per market hog (155 lb dressed wt)		Total Costs[1] (less weanling costs)				
		$17	$19	$21	$23	$25
Price Per cwt	Gross returns/hog	Break-even Weanling Costs				
$24	$37.20	$16.20	$14.20	$12.20	$10.20	$ 8.20
$26	$40.30	$19.30	$17.30	$15.30	$13.30	$11.30
$28	$43.40	$22.40	$20.40	$18.40	$16.40	$14.40
$30	$46.50	$25.50	$23.50	$21.50	$19.50	$17.50
$32	$49.60	$28.60	$26.60	$24.60	$22.60	$20.60
$34	$52.70	$31.70	$29.70	$27.70	$25.70	$23.70

Example: Relevant cost = $19; expected return = $28/cwt ; desired labor return = $4.00. The upper bargaining limit would be $20.40 per weanling.

[1] If the feeder operation is already under way (the fixed investments have been made) the relevant production cost will be the Variable Costs. The upper bargaining limit in the short run can then be calculated by using Variable Costs instead of Total Costs.

SWINE MARKETING

Production and marketing decisions cannot be viewed in isolation. Production decisions must be based on consumers' demands. The marketing system reflects these demands back to the producer. Swine producers, therefore, must have as their goal a marketing system which operates at the lowest cost consistent with satisfying the wants of the consumer. The consumer in turn can be expected to indicate his desire for a particular quality or form of product by the premium he is willing to pay.

Swine marketing really begins when the decision is made to produce, and ends with a satisfied smile on the face of the well-fed consumer. Marketing entails the performance of certain functions which are services added to a product as it moves from the producer to the consumer. These functions may be classified into those of exchange, those associated with the physical handling of the product, and those involved in enabling exchange and physical handling of the product to occur with greatest efficiency.

Thus, marketing consists of buying and selling; of providing for storage, transportation and processing; of grading, financing, and assuming risk; and of providing for an enlargement of the demand for the product. Efficient performance of these functions is dependent upon the presence of an accurate and timely information system. This is important since the returns to swine producers reflect the price the consumer is willing to pay for the volume of product offered, less the marketing cost. Producers should, therefore, be vigilant to ensure that the

marketing functions are performed as efficiently as possible. It is the producer who is the residual claimant of the consumer's expenditure.

Consumer preferences

In their purchasing patterns of the past few years, consumers have indicated a preference for beef over pork. There has also been an increase in the consumption of poultry products as the price of these products has gone down.

When purchasing pork at the retail counter, consumers look for leanness, fineness of texture, freshness, eye appeal, closeness of trim, and price in relation to value.

The inferior status of pork in comparison to beef in the consumers' eyes arises largely from the relatively greater fat content in the retail cuts of pork and the failure of the industry as a whole to successfully promote pork products. While the method of presentation of pork products to the consumer is largely beyond the control of the producer, keen competition between retail outlets should bring about continuous improvement in this area.

Recent trends in per capita meat consumption in Canada and a forecast to 1980 are shown in Table 6. Pork consumption on a per capita basis is relatively constant and will likely continue as such in direct proportion to the increase in population. However, consumption of pork as a percentage of total meat consumption is declining, and this trend is expected to continue. This decline has been a spur for action by producers and the trade to improve the quality of pork products. Such action has given rise to the new Canadian hog carcass grading system.

Table 6. Per Capita Consumption of Meat, Canada, 1949-1980

	(pounds carcass weight)				
	1949-51 Average	1959-61 Average	1964-66 Average	1975	1980
Total	129.8	141.3	149.3	163.1	168.2
Beef	52.3	68.4	81.0	94.8	100.0
Veal	9.0	6.9	7.4	7.0	6.9
Pork	56.2	53.1	49.6	50.0	50.0
Lamb & Mutton	2.3	3.1	3.3	3.3	3.3
Other Meats	10.3	9.9	8.0	8.0	8.0
Poultry (evisc. wt.)	16.7	29.7	37.1	45.7	49.0

Hog carcass grading system

A new hog carcass grading system was introduced late in 1968. This new system was the result of the combined efforts of producers, packers and government agencies to discover means whereby the true value of a carcass could be estimated. Research demonstrated that the combined thickness of fat at the loin and the shoulder, and carcass weight were closely related to carcass value determined by the prices and weights of the respective cuts.

A value index system was developed whereby carcasses having approximately the same fat thickness and carcass weight measurements as the former "B" grade were

assumed to have a carcass value index of 100. The values of carcasses having other measurements were expressed as an index by comparing their respective values to that of the index 100 carcass. Value index differentials according to carcass weight
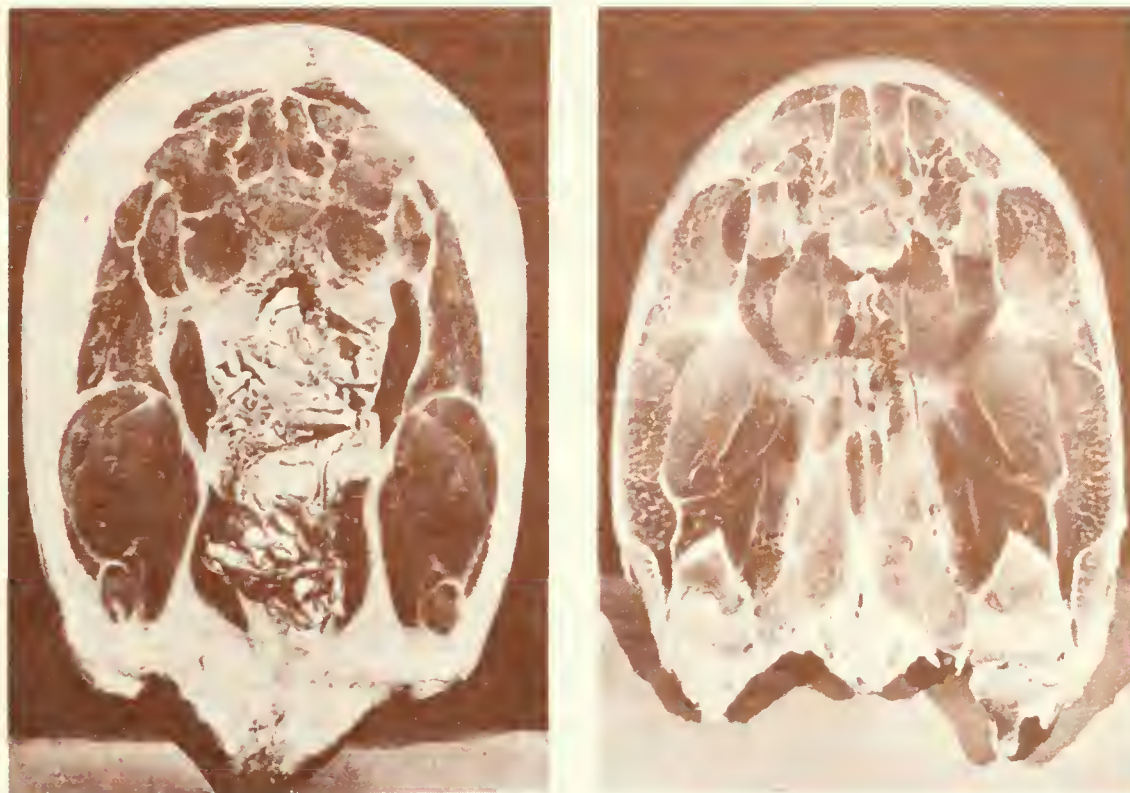
Figure 1. Cross-sections taken in the ham regions of two market weight pigs differing greatly in muscling and fat deposition. Carcass quality is under genetic as well as feed and management influence and is an important factor in determining net returns for swine production. (Photos courtesy Iowa State University).

and combined fat thickness are shown in Table 7. Under the new index grading system the value index established for an individual carcass is subject to demerits according to its type, quality and necessary trim.

Example of calculation of the value of a carcass:
  Warm dressed weight 162 pounds
  Total backfat thickness 2.1 inches
  Basic index 112 (from table)
  Type demerit (roughness) deduct 3 points
  Quality demerit (oily carcass) deduct 10 points
  Adjusted index 99
  Trimable demerit 4 pounds (farm origin)
  Settlement weight 162— 4 = 158 pounds
  Value of carcass 99 X 158 X $30.00 (price of index 100) = $46.93

Table 7. Table of Differentials

Backfat in inches	Predicted Yield	90 to 124 lb	125 to 129 lb	130 to 139 lb	140 to 149 lb	150 to 159 lb	160 to 169 lb	170 to 180 lb	181 to 195 lb	196 lb and over	Ridgling
– 1.9	69.7%	87	105	109	110	112	112	112	91	85	67
2.0 – 2.1	69.0%	87	103	107	109	110	112	112	91	85	67
2.2 – 2.3	68.2%	87	102	105	107	109	110	110	91	85	67
2.4 – 2.5	67.5%	87	100	103	105	107	109	109	91	85	67
2.6 – 2.7	66.7%	87	98	102	103	105	107	107	91	85	67
2.8 – 2.9	66.0%	87	97	100	102	103	105	105	91	85	67
3.0 – 3.1	65.2%	87	95	98	100	102	103	103	91	85	67
3.2 – 3.3	64.5%	87	92	97	98	100	102	102	91	85	67
3.4 – 3.5	63.8%	87	88	95	97	98	100	100	91	85	67
3.6 – 3.7	63.0%	87	88	92	95	97	98	98	91	85	67
3.8 – 3.9	62.3%	87	88	88	92	95	97	97	91	85	67
4.0 – 4.1	61.5%	87	88	88	88	92	95	95	87	82	67
4.2 – 4.3	60.8%	87	88	88	88	88	92	92	87	82	67
4.4 – +	60.1%	87	88	88	88	88	88	88	87	82	67

Note: Not all carcasses are subject to demerit. Reasons for any demerits will be outlined on the settlement form. The above example is for illustration purposes only.

The new system allows the estimate of the price of an animal to more closely reflect its cut-out value. The demerit and index system also provides an indication to the producer of those areas in which herd improvement is required. Since the price of swine is determined on the basis of index 100, as the price rises the differentials in values of the respective categories of animals widen providing added incentives for improvement. The system will require continuous review since, as the average conformation of swine changes and the relative value of individual cuts varies, errors will be introduced into the calculation of carcass worth.

price determination methods

Producers should judge the channels through which their swine are marketed by the following criteria:
1. competitiveness
2. cost
3. speed
4. equity
5. convenience

Competiton has the greatest impact on producer returns. To have true competition, many buyers and sellers must be present, or buyers and sellers must be equally well informed and skilled in bargaining. Direct deliveries by the producer to the processing plant have brought about such a decline in the degree of competition on many markets that price to producers probably declined.

However, direct deliveries are efficient in that yard facility requirements are reduced, as are labor costs in handling the hogs. Speed in marketing reduces shrinkage losses and avoids excess transportation costs.

The importance of convenience varies among producers. To be efficient, the price paid for a given quality of animal should be the same to all sellers at a given location, and any differential locations should accurately reflect transportation and associated costs.

Teletype selling — To provide fair competition, many provinces have utilized marketing board legislation to establish centralized selling by teletype for swine. This has met with general acceptance by both producers and the trade. In most provinces using this method of sale, all swine are directed through the system. Manitoba is an exception. There, a producer may opt out of the system, but must pay the sales fee assessed per hog.

The teletype marketing procedure is simple and, if applied efficiently, can greatly reduce marketing costs as hogs are sold in lots, thus reducing movement and shrinkage. Composition of these lots is varied to appeal to many buyers. The system maintains the anonymity of the buyer, and the use of the Dutch auction bidding system makes collusion among buyers as to price very difficult.

Considerable expertise has been developed in the central offices responsible for the operation of the teletype systems, thus enhancing the competitiveness and

efficiency of the system. Price levels in other markets are watched closely to ensure that the price established reflects the true worth of the swine sold. Hours of system operation are restricted to concentrate buyer interest.

Where the system has been in use over a period of time, it has become apparent that a high degree of price variability exists during the market day. This within-day price variability is greater under the teletype system than under the public market-direct-to-plant combination previously in use.

Within-day pricing equity, that is, the same price on a given day for an equivalent product with regard to location, can best be achieved through pooling. As yet, however, pooling has not received significant producer support. Where marshalling yards are used, producers emphasize their personal convenience and the tendency is to have a proliferation of such yards with a subsequent increase in marketing costs.

When judged according to the criteria laid down earlier, the teletype system offers distinct advantages to other marketing methods. However, present teletype systems cannot be considered to be the ultimate in marketing. They merely enhance the competitiveness in the market place for a product which is sold under objective grade standards.

Under the teletype sales system, the bargaining ability of the producer is no longer the critical factor in the determination of net returns. On the other hand, personal contact between the buyer and seller is no longer necessary for the exchange of title, and the vital marketing information which this contact used to provide must now be obtained in other ways. However, in comparison to other marketing methods, such as sale at packer buyer stations, or direct to packing plants, the teletype system offers particular advantages to the average producer in the sale of his slaughter animals.

Marketing feeder pigs – The feeder pig market is highly disorganized in comparison to the slaughter hog market. Several methods of sale are common for weanling and feeder pigs, including private treaty between farmers, auction, commission agent and contract sales. Evaluation of the pig is largely by eye appraisal and producer reputation.

A pig's value as a feeder depends on its conversion rate and rate of gain as well as on inherited carcass characteristics. Such characteristics cannot be ascertained with accuracy upon physical examination of the feeder pig, so producers with swine finishing operations should seek information about these characteristics at time of purchase.

When purchasing pigs in public premises, this information is often not available. Furthermore, there is a great risk of introducing disease into the swine operation when pigs are purchased at public premises. Purchase of feeder pigs directly from a producer is one means of reducing this risk, provided the disease history of the pigs is known.

It is difficult to establish a representative price for feeder pigs. The feeder producer must receive a price sufficiently high to encourage him to remain in the business, while the producer finishing the animals must be able to purchase at a price which will enable him to obtain a positive margin on his enterprise.

Auctions and commission firms may be used to establish price. However, direct

sales have advantage in that the reputation of the producer is known. Furthermore, if the potential benefits from specialization in the farrowing and finishing operations are to be obtained, there must be a close tie between the producer and purchaser of the feeders to ensure that the farmer produces what the latter needs and desires. A contract may, therefore, be beneficial to both parties.

The budget examples given in the Appendix show the procedure to follow in budget calculations. Under the budgets prepared on those pages, approximately equal returns to labor are obtained by the producers of feeder and slaughter pigs when 40 pounds weanlings are priced at one half the anticipated price for index 100 slaughter animals plus $3.00 when barley is 2 cents per pound. For each tenth of a cent fall in the price of barley, the price of the weanling should be increased by 20 cents.

The following example will illustrate the calculation of a fair price for weanlings under the production conditions laid down in the budget section, and where the price of index 100 animals is $30 per hundredweight and barley is 1.5 cents per pound:

One half index 100 price = 0.5 × $30.00	$15.00
Add	3.00
Add differential due to barley price	1.00
(2 − 1.5) 10 × 20	
Price for Weanling	$19.00

If the price of index 100 animals declined to $28 per hundredweight and the price of barley rose to two and a half cents per pound, the price for the weanling would decline as follows:

One half index 100 price = 0.5 × $28.00	$14.00
Add	3.00
Add differential due to barley price	−1.00
(2 − 2.5) 10 × 20	
Price for weanling	$16.00

In the above calculations, the rules for calculating weanling values now have a feeder bias. This is because technological improvements in production have provided proportionately larger cost savings to the pig feeding as compared to the weanling enterprise. The formula used in calculating weanling prices should be reviewed and adjusted as necessary to reflect individual situations and, in particular, the market outlook.

SWINE PRICES

The price of slaughter swine varies seasonally and cyclically with a definite upward or downward trend evident over the long term. These variations are superimposed on each other, and the combined variation is reflected in the price movements.

Seasonal price variation

Seasonal price movement should be of particular interest to swine producers since, other things being equal, production should be geared to take advantage of

high price periods.

Prices vary seasonally because of changes in the demand for and supply of swine. The slaughter level is a contributing factor to the seasonal price movement. In general, lower prices follow high slaughter levels. Pork consumption also follows a seasonal pattern, thus giving rise to a within-year change in the demand-supply relationship and thus a change in price.

Figure 2 shows average prices for B dressed swine, by months, at the Saskatoon

Figure 2. Seasonal Price and Slaughter Variation, Average 1950–69.

and Toronto markets. The chart also shows a changing price differential between the two markets within the year. Producers should study the price differentials and direct their livestock to the most advantageous market available to them.

Cyclical price variation

Swine prices and slaughter move in cycles averaging about 4 years in length. As shown in Figure 3, prices and slaughter move in opposite directions with low prices usually accompanying high slaughter levels. Cycles may be set off by changes in feed prices as well as by changes occuring outside of agriculture. Production cycles imply less than optimum use of facilities and thus increased production costs.

As swine production takes place more and more in a controlled environment some people believe the cycles will become less pronounced, and may even disappear. However, the astute new entrant into swine production will carefully consider the stage of the production cycle before committing himself. Other things equal, entry should be timed to take advantage of the lower breeding stock prices which normally prevail near the peak of the production cycle.

Other price movements

Price cycles at the Saskatoon and Toronto markets are not consistent, as can be seen from Figure 3. This reflects relative changes in demand and supply, particularly during the low price phases of the cycles. Periods of low net return from grain, which encourage diversification, have often preceded peaks in output cycles.

Because of rising population and total demand, the long term trend is for inspected slaughter to increase. This rise is being accompanied by a slight price increase, although this price increase has not kept pace with the decline in the purchasing power of money. Improved technology has allowed producers to remain in business at a time when the prices of many inputs have increased substantially.

The hog-barley ratio

The hog-barley ratio is the number of bushels of No. 1 feed barley, or hundredweights of mixed feed, equivalent in value to 100 pounds of index 100 live hogs, basis Winnipeg prices for hogs and barley. This ratio provides an indication of the relative profitability of a hog operation.

An increase in the ratio, meaning greater profitability in swine production, tends to be accompanied by an increase in slaughter levels one year later. In turn, increases in slaughter are usually accompanied by a price decline. Movement of the hog-barley ratio over time is compared with the level of inspected slaughter in Figure 4.

A high hog-barley ratio is not necessarily a signal for a producer to enter swine production. In general, a decline in the ratio would indicate a better time for entry. For those already engaged in production, a high ratio should be a signal for a careful examination of the net returns from feeding swine to heavier weights. An attempt should be made to determine whether the returns from the increase in weight are sufficient to more than offset the decline in the efficiency of feed conversion and in the market price associated with swine of increasing backfat thickness.

Figure 3. Hog Prices, Saskatoon and Toronto; Inspected Slaughter, Canada; 1950–69.

THE COMPETITIVE POSITION OF CANADIAN
SWINE PRODUCERS

Canadian swine producers operate within the framework of a continental market. Because of relatively low tariffs on the movement of swine and pork products between Canada and the United States, these products move freely across the Canada-U.S. border (Table 8).

Live swine are not imported into Canada because of the risk of introducing hog cholera. Movement of live swine to the United States has been limited because of the historical premiums offered for high quality carcasses in Canada. Canadian back bacon, hams and bellies are considered premium products in the U.S. where they
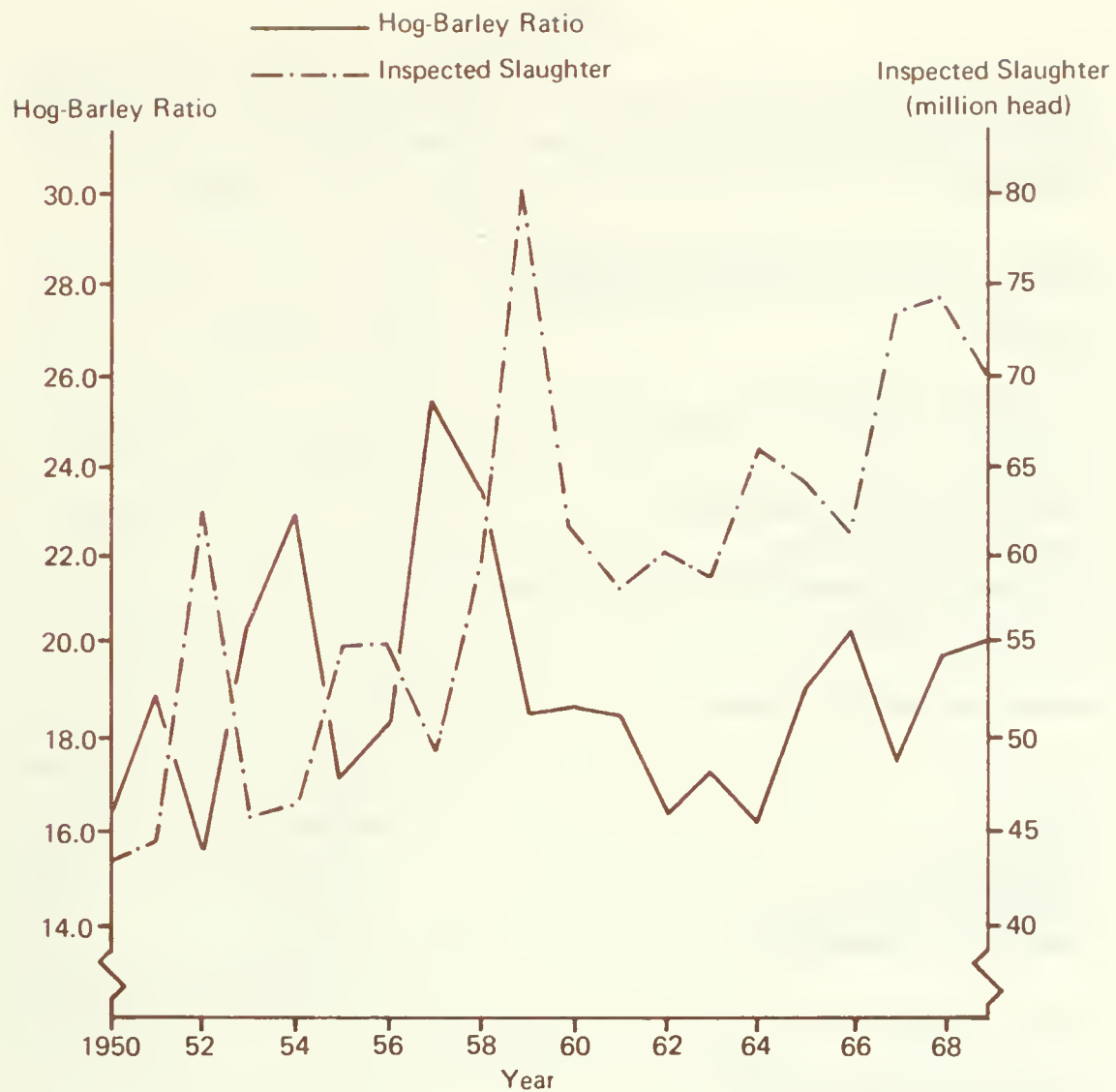
Figure 4. Hog-Barley Ratio and Inspected Slaughter, 1950–69.

Table 8. Tariff Rates on Swine and Pork, Canada and United States, 1970

	Canadian Tariff	U.S. Tariff
	(cents per pound)	
Swine (alive)	0.5	0.8
Pork (fresh and frozen)	0.5	1.0
Bacon and hams	1.75	2.0 (unboned)
		3.0 (boned)

are sold at higher prices than local products. Imports of American pork products into Canada are made on a price basis, as there is no indicated consumer preference here for American pork.

APPENDIX

The purpose of the following budgets is to explain the procedure for estimating costs and returns and to show how various factors can affect the profitability of production. Note the assumptions which precede each budget example.

ANNUAL COSTS PER BREEDING ANIMAL

Assumptions

Above-average management
$430/animal investment in facilities
7% investment charge
Breeding herd in total confinement
$3/ton for feed processing
Replacements purchased from outside the herd
Feed costs as in Table 3

Variable costs/breeding animal

	Sow	Boar
Feed	$42.50	$35.40
Feed processing	2.85	2.28
Machinery use and utilities	5.00	4.00
Veterinary and medicine	4.00	4.00
Total variable costs/year	$54.35	$45.68

Fixed costs/breeding animal[1]

	Sow	Boar
Depreciation on facilities	$38.70	$38.70
Investment on facilities	16.56	16.56
Investment on animal	6.00	7.00
Loss and replacement	13.00	30.00
Insurance on facilites	1.19	1.19
Total fixed costs/year	$75.45	$93.45

Total

	Sow	Boar
Costs/year (variable and fixed)	$129.80	$139.13

---

[1] If the breeding herd runs outside, fixed costs will be lower and feed consumption will be higher. If replacements are selected from the herd, the costs of replacements will be lower.

SPECIALIZED WEANLING PRODUCTION

Assumptions	Your business[2]
Above-average management	_____
60 sows and 3 boars valued at $6,300	_____
$430/sow investment in facilities	_____
Yearly cost of facilities/weanling	_____
investment: ($430 + 10% residual) $\times$ $^1/_2$ $\times$ 7%	_____
depreciation: ($430 - 10% residual) $\div$ 10 years	_____
insurance: $5/$1,000 average investment	_____
16 weanlings/sow/year or 960/year	_____
Weanlings sold at 35 pounds	_____
$3 per ton for feed processing	_____
Feed costs as in Table 3	_____

Variable costs/weanling[3]

Weanling feed	$2.50	_____
Share of sow and boar feed	2.76	_____
Feed processing	.19	_____
Utilities, machinery use and miscellaneous	.60	_____
Veterinary and medicine	.70	_____
Add: interest on variable costs	.15	_____
Total variable costs/weanling	$6.90	_____

---

[2] Prospective producers should record their expectation as to performance and costs in this column, and check their estimates with an experienced hog man or Farm Management Specialist.

[3] Hired labor can be entered as a variable cost.

Fixed costs/weanling   Your business

    Depreciation on facilities[4] $2.42   _____

    Investment on facilities[4]   1.03   _____

    Investment on breeding herd[4]   .46   _____

    Losses and replacements in herd   .90   _____

    Insurance on facilities   .08   _____

    Total fixed costs/weanling $4.89   _____

Total

    Costs per weanling $11.79   _____

    Add: labor cost/weanling[5]   _____

    All costs plus labor   _____

Factors affecting net returns
(based on example procedure below)

1 Productivity/sow

    No. pigs weaned/sow/year   Total costs/weanling
                                               ($)

        18   ....   10.94
        16   ....   **11.79**
        13   ....   13.63
        10   ....   16.54

---

[4] If actual interest charges are greater than shown for facilities and breeding stock, then such costs should be substituted in place of the above allowances.

[5] The farmer's own labor should be estimated at its opportunity cost.

    Example procedure – labor return summary
Gross return	$16.00/weanling
Less variable cost	6.90
Return over variable cost	$ 9.10
Less fixed cost	4.89
Return to labor and management	$ 4.21/weanling
Return to labor and management/sow/year: 16 × $4.21	$67.36/sow

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2 Investment/sow

Value of facilities/sow ($)	Total costs/weanling ($)
100	9.09
250	10.32
430	**11.79**
550	12.84

3 Grain prices

Price/lb (¢)	Total costs/weanling ($)
1.0	11.15
1.25	11.46
1.5	**11.79**
1.75	12.10
2.0	12.41

4 Grain consumption/sow

Grain quantity (lb)	Total costs/Weanling ($)
1,900	**11.79**
2,500	12.41
3,000	12.93

5 Break-even prices for a $4 labor return/weanling

No. pigs weaned/sow/year	Total costs (less labor) ($)	Price needed ($)
18	10.94	14.94
16	**11.79**	**15.79**
13	13.63	17.63
10	16.54	20.54

SPECIALIZED FEEDER OPERATION

Assumptions		Your business
Above-average management		_____
1,000 feeders/year capacity		_____
$25/hog investment in facilities		_____
Yearly cost of facilities		_____
investment: ($25 ÷ 10% residual) $\times \frac{1}{2} \times 7\%$		_____
depreciation: ($25 − 10% residual) ÷ 10 years		_____
insurance: $5/$1,000 average investment		_____
35-lb weanlings purchased for $16		_____
Feed conversion of 3.25:1		_____
$3/ton for feed processing		_____
Feed costs as in Table 3		_____

Variable costs/hog fed[6]

		Your business
Feed	$12.06	_____
Feed processing	.69	_____
Utilities, machinery use and miscellaneous	.90	_____
Veterinary and medicine	.50	_____
Marketing	1.00	_____
Subtotal	$15.15	_____
Purchase of weanling	$16.00	_____
Loss allowance	1.00	_____
Add: interest on variable costs	.73	_____
Total variable costs/hogs fed	$32.88	_____

---

[6] Hired labor can be added as a variable cost.

Fixed costs/hog fed   Your business

    Depreciation on facilities[7] $ 2.25   _____

    Investment on facilities[7]   .96   _____

    Insurance on facilities   .07   _____

    Total fixed costs/hog fed $ 3.28   _____

Total

    Costs/hog fed $36.16   _____

    Add: labor cost[8]   _____   _____

    All costs plus labor   _____   _____

Factors affecting net returns
(based on example procedure below)

1 Grain prices

Price/lb (¢)		Total costs/hog fed ($)
1.0	....	33.84
1.25	....	35.00
1.5	....	**36.16**
1.75	....	37.32
2.0	....	38.48

---

[7]If actual interest charges are greater than shown for facilities, then such costs should substituted in place of the above cost allowances.

[8]The farmer's own labor should be estimated at its opportunity cost.

Example procedure — labor return summary

Gross return	$42.00/hog fed
Less variable cost	32.88
Return over variable cost	$ 9.12
Less fixed cost	3.28
Return to labor and management	$5.84/hog fed

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2 Feed conversion

Conversion ratio	Total cost/hog fed[9] ($)
3.0:1	35.17
3.25:1	**36.16**
3.5:1	37.14
4.0:1	39.10
4.5:1	41.06
5.0:1	43.02

3 Investment/hog fed

Value of facilities/hog fed ($)	Total costs/hog fed ($)
10	34.20
15	34.85
20	35.51
25	**36.16**
30	36.81

4 Turnover

No. hogs fed/year	Total cost/hog fed ($)
1,000	**36.16**
900	36.45
800	36.89

5 Break-even weanling costs for a $4 labor return/hog fed

Grain price/lb (¢)	Gross return/hog ($)	Maximum weanling cost ($)
1.0	42.00	20.16
1.25	42.00	19.00
1.5	**42.00**	**17.84**
1.75	42.00	16.68
2.0	42.00	15.52

---

[9] The total costs per hog may not increase as rapidly as indicated if the higher feed conversion ratios result from using more grain and less supplement in the ration.

6 Break-even hog prices for a $4 labor return/hog fed

Grain price/lb	Total costs	Minimum price
	(less labor)	needed[10]
(¢)	($)	($)
1.0	33.84	24.40/cwt
1.25	35.00	25.20
1.5	**36.16**	**25.90**
1.75	37.32	26.60
2.0	38.48	27.40

7 Hog price required for various labor returns/hog fed

Labor return	Total costs	Minimum price
desired	(less labor)	needed[10]
($)	($)	($)
4	36.16	25.90/cwt
6	36.16	27.20
8	36.16	28.50
10	36.16	30.00

FARROW-FINISH PRODUCTION

Assumptions	Your business
Above-average management	_____
60 sows, 3 boars valued at $6,300	_____
$800/sow investment in facilities	_____
Yearly cost of facilities/sow	_____

investment:
($800 + 10% residual) $\times \frac{1}{2} \times$ 7%   _____

depreciation:
($800 - 10% residual) $\div$ 10 years   _____

insurance:
$5/$1,000 average investment   _____

15 market hogs/sow/year or 900/year   _____

Feed conversion of 3.25:1 from 35-200 lb   _____

---

[10] Minimum prices are in terms of dressed weight price/cwt for hogs dressing 155 lb (premium not included).

$3/ton for feed processing.   _____

Feed costs as in Table 3.   _____

Variable cost/farrow-finish hog[11]

Feed

breeding herd	$ 2.95	_____
fed hog	14.56	_____
Feed processing	.89	_____
Utilities, machinery use and miscellaneous	1.50	_____
Veterinary and medicine	1.20	_____
Marketing	1.00	_____
Loss allowance	1.00	_____
Add: interest on variable costs	.64	_____
Total variable costs/hog	$23.74	_____

Fixed cost/farrow-finish hog

Depreciation on facilities[12]	$ 4.80	_____
Investment on facilites[12]	2.05	_____
Investment on breeding herd[12]	.49	_____
Loss and replacement in herd	1.00	_____
Insurance on facilities	.15	_____
Total fixed cost/hog	8.49	_____

_____

[11] Hired labor can be added as a variable cost.
[12] If actual interest charges are greater than shown for facilites and breeding stock, then such costs should be substituted in place of the above cost allowances.

Total   Your business

  Cost/hog $32.23   _____

  Add: labor cost[13]   _____   _____

  All costs, including labor   _____   _____

Factors affecting net returns
(based on example procedure below)

1 Productivity/sow

                                                    Total costs/market hog
                                                              ($)
     17 . . . . 30.86
     15 . . . . **32.23**
     12 . . . . 35.14
      9 . . . . 39.99

2 Investment/sow   Total cost/market hog
      ($)   ($)
     400 . . . . 28.73
     600 . . . . 30.48
     800 . . . . **32.23**
    1000 . . . . 33.98

3 Grain prices   Total costs/market hog
   Price/lb
      (¢)   ($)
     1.0 . . . . 29.24
     1.25 . . . . 30.73
     1.5 . . . . **32.23**
     1.75 . . . . 33.70
     2.0 . . . . 35.20

_____

[13] the farmer's own labor should be estimated at its opportunity cost.

  Example procedure — labor return summary

Gross return	$42.00/market hog
Less variable cost	$23.74
Return over variable cost	$18.26
Less fixed cost	$ 8.49
Return to labor and management	$ 9.77/market hog

4 Feed conversion

Conversion ratio	Total cost/market hog[14] ($)
3.0:1	31.06
3.25:1	**32.23**
3.5:1	33.45
4.0:1	35.74
4.5:1	38.03
5.0:1	40.31

5 Turnover

No. hogs/marketed/year	Total cost/market hog ($)
900	**32.23**
800	33.29
700	34.66

6 Break-even hog prices for an $8 labor return/market hog

Grain price/lb (¢)	Total costs (less labor) ($)	Minimum price needed[15] ($)
1.0	29.24	24.00/cwt
1.25	30.73	25.00
1.50	**32.23**	**26.00**
1.75	33.70	27.00
2.0	35.20	28.00

7 Hog prices required for various labor returns/market hog

Labor return desired ($)	Total costs (less labor) ($)	Minimum price needed[15] ($)
6	32.23	24.00/cwt
8	32.23	26.00
10	32.23	27.30
12	32.23	28.60

---

[14] The total costs/hog may not increase as rapidly as indicated if the higher feed conversion ratios result from using more grain and less supplement in the ration.

[15] Minimum prices are in terms of dressed weight price/cut for hog dressing 155 lb (no premium considered).

Production and Marketing Statistics

The following publications provide much useful statistical information relating to swine production and marketing.

Canada Department of Agriculture, *Livestock and Meat Trade Report*. Ottawa: Markets Information Section, Production and Marketing Branch, Canada Department of Agriculture, weekly.

Canada Department of Agriculture, *Origin of Livestock Marketed*. Ottawa: Markets Information Section, Production and Marketing Branch, Canada Department of Agriculture, monthly.
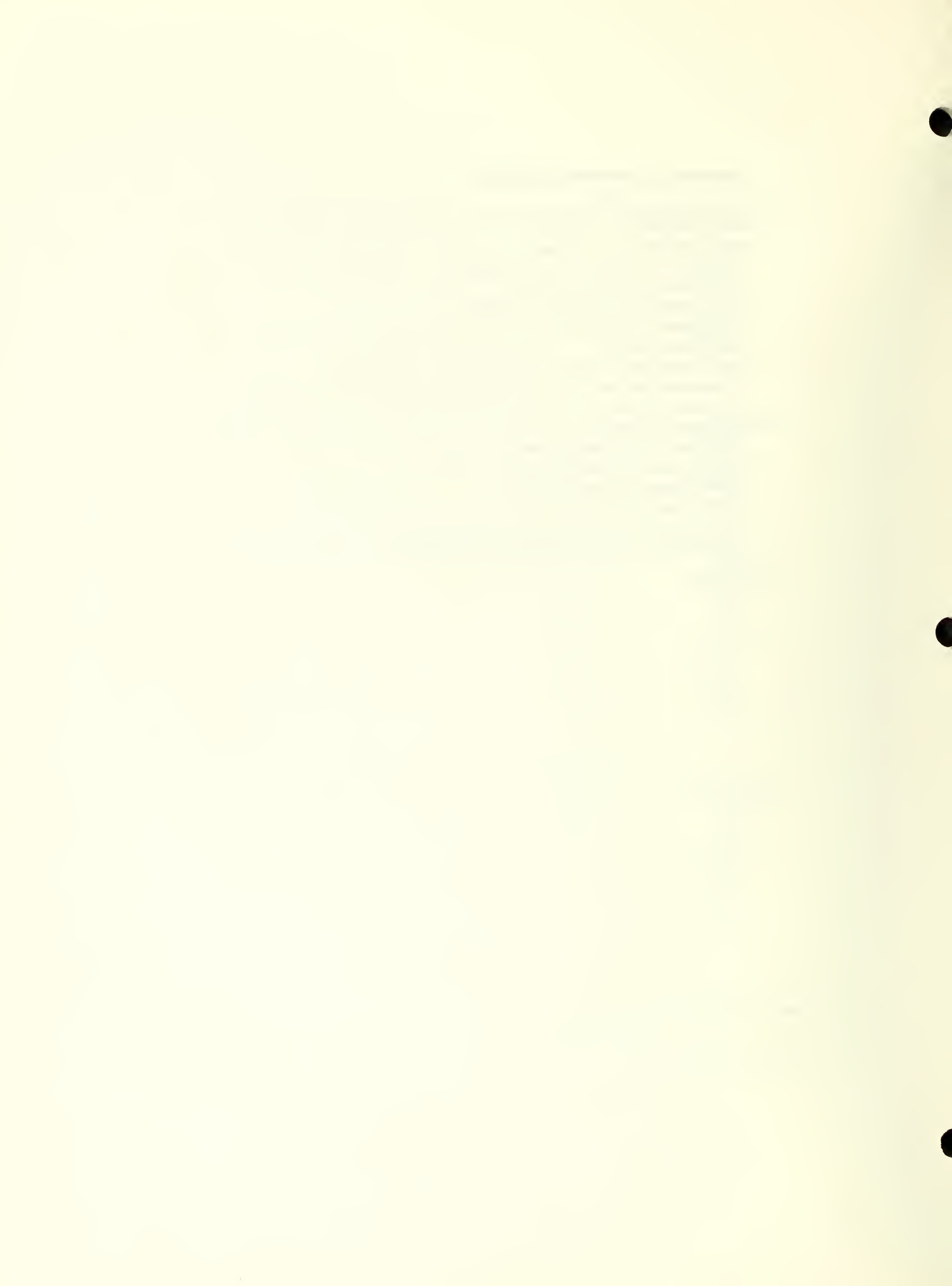
Canada Department of Agriculture, *Livestock Market Review*. Ottawa: Markets Information Section, Production and Marketing Branch, Canada Department of Agriculture, annual.
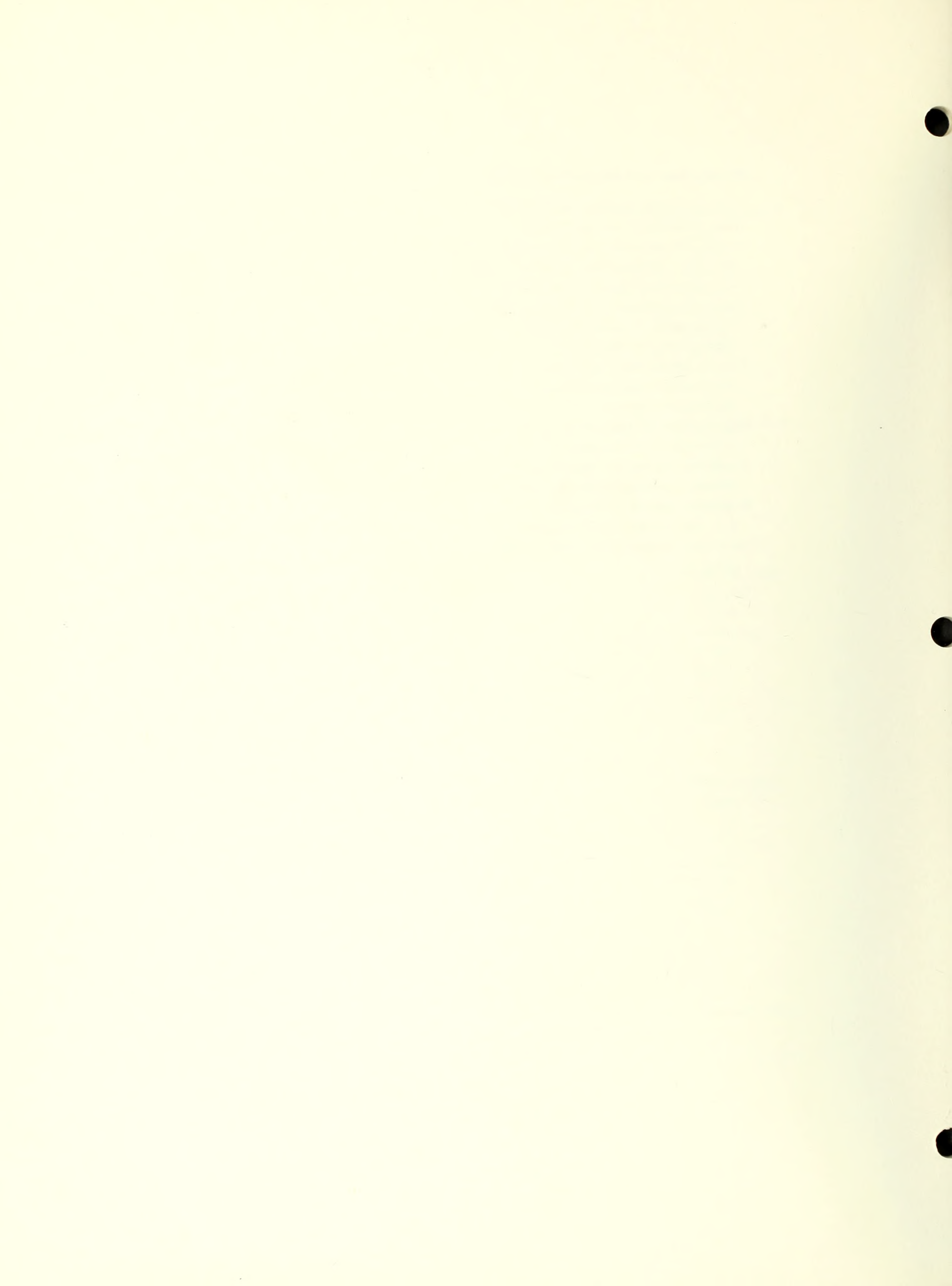
Department of Agriculture Economics, *Selected Livestock Statistics*. Saskatoon: University of Saskatchewan, biennial compilation.

Dominion Bureau of Statistics, *Report on Livestock Surveys*, Cat. No. 23—005, Ottawa: Queen's Printer, quarterly.

Dominion Bureau of Statistics, *Canadian Livestock and Animal Products Statistics*, Cat. No. 23—003, Ottawa: Queen's Printer, annual.

Dominion Bureau of Statistics, *Census of Canada*. Ottawa: Queen's Printer, census years.