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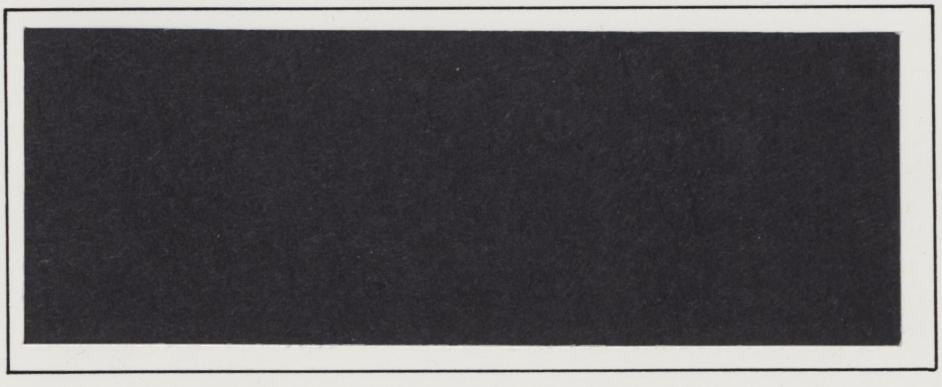

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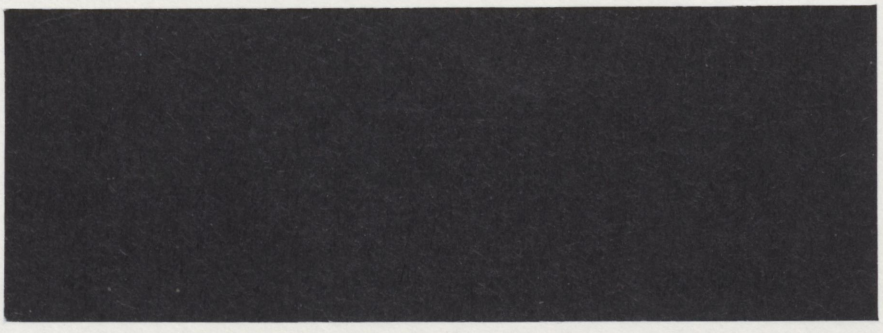

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THE NATIONAL TRIPARTITE STABILIZATION PROGRAM FOR RED MEATS: CATTLE MODELS

(Working Paper 2/88)

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March 1988

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ACKNOWLEDGMENTS

This report is the result of the efforts undertaken by the Technical Subcommittee of the National Tripartite Beef Stabilization Committee to review the model used for beef stabilization calculations. The revised beef model was accepted by the Beef Committee in May 1987.

Appreciation to the various people who reviewed the initial draft report is gratefully acknowledged.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	i
TABLE OF CONTENTS	ii
1. INTRODUCTION	1
2. COW-CALF MODEL	1
2.1. Characteristics of the Cow-Calf Sector	2
2.2. Scope of Cow-Calf Model	3
2.3. Rationale for Indexed Moving Average Price	4
2.4. Price Calculation	5
2.5. Payment Calculations	6
3. SLAUGHTER CATTLE MODEL	8
3.2. Scope of Slaughter Cattle Model	8
3.3. Rationale for Guaranteed Margin	9
3.4. Price Calculation	10
3.5. Cost Calculation	11
3.5.1. Animal Classification	12
3.5.2. Cost Components	13
3.5.2.1. Feeder Animals	13
3.5.2.1.1. Long Keep	14
3.5.2.1.2. Short Keep	14
3.5.3.1. Feed	15
3.5.3.2. Feed Ration	16
3.5.3.3. Feed Prices	18
3.5.3.4. Other Cost Components	19
3.5.3.4.1. Interest	19
3.5.3.4.2. Trucking	20
3.5.3.4.3. Selling Cost	20
3.6. Payment Calculation	21
4.0. FEEDER CATTLE MODEL	23
4.1. Characteristics of Feeder Cattle Sector	23
4.2. Scope of Feeder Cattle Model	23
4.3. Price Calculation	24
4.4. Cost Calculation	24
5.0. CONCLUDING REMARKS	27
REFERENCES	28
APPENDIX	29

1.0 INTRODUCTION

The National Tripartite Stabilization Program (NTSP) for red meats became effective on January 1, 1986 after agreements with certain provinces and the federal government were signed in November 1985. These agreements were tabled under the amendments made to the Agricultural Stabilization Act in July 1985. The NTSP for red meats is the culmination of several years of negotiations between the Federal and Provincial governments and producer organizations.

For beef producers, two complementary and self-sustaining national tripartite plans are in place. They are the cow-calf program and the feeder/slaughter cattle program. The feeder/slaughter program includes three components; a feeder cattle plan, a slaughter cattle plan and a combined feeder/slaughter plan. The beef program has been designed such that it would not "interfere with a producer's decisions on the products to be produced, the production practices to be followed, or the region or area in which production is to be undertaken."[1]

The cow-calf program uses an Indexed Moving Average Price (IMAP) approach while both the slaughter and feeder cattle programs use a Guaranteed Margin (GM) approach to calculate support prices which will determine if a payment is to be generated for any period.

[1] Proposed Tripartite Red Meat Stabilization Program, January, 1985, Agriculture Canada.

This report provides a description of the cattle models and documents the calculation procedures and assumptions that underlie the price and cost models, which are used to calculate the support levels. The cow-calf model is described in Section 2 and the slaughter/feeder cattle models are described in Sections 3 and 4.

2.0 COW-CALF MODEL

2.1. CHARACTERISTICS OF THE COW-CALF SECTOR

Beef calves are raised in practically all provinces in Canada. In general cattle raising is concentrated in the Prairie Provinces, Ontario and Quebec. Cow-calf operations are normally small scale and are carried on as a part of the general farm operations or as a supplement to off-farm employment. According to the 1986 census, 94% of cow-calf farms are of a herd size of less than 100. Generally, cow-calf operations can be categorized as:

1) Breeding Stock Production: The operator maintains a purebred herd and often produces calves throughout the year. The calves are weaned at about 6 months and fed through to 18 months for sale as bulls and bred heifers.

2) Feeder Production: This is the most common form of commercial operation. Calves are born in late winter or early spring. They are weaned between 400 to 450 pounds.

3) Stocker Production: This an extension of the feeder production operation. Calves are kept over the winter and sold in spring when they weigh between 600 to 700 pounds.

2.2. SCOPE OF COW-CALF MODEL

The National Tripartite Stabilization Program for cow-calf is intended to provide protection against market instability for those producers keeping beef cows for the purpose of producing weaned calves (feeder animals) for sale or for finishing on their own farms[1]. This is an annual program that uses an "Indexed Moving Average Price" (IMAP) approach. The support level in any year is calculated at 85% of the preceding ten years Indexed Moving Average Price (IMAP-85). The national average price of calves is calculated from regional market prices, weighted by provincial cow numbers and adjusted for the general rate of inflation in the economy.[2] The adjustment for inflation puts the year's price on a current dollar base so that the averaging accounts for changes in general price levels. The adjusted price is the average for the preceding ten year period; this is called the Indexed Moving Average Price (IMAP). In any year that the

[1] It should be noted that the cow-calf program only covers the calf production stage.

[2] The inflation measure used is the Gross Domestic Product (GDP) implicit price index with 1981=100.

national average market price of calves falls below the support price, the difference is paid to participating producers (expressed on a per cow basis).

2.3. RATIONALE FOR INDEXED MOVING AVERAGE PRICE (IMAP)

Cow-calf operations are often secondary enterprises or are operated in conjunction with off-farm employment. Given the nature of the industry, estimation of costs is very difficult. Cash costs tend to be a small proportion of total cash costs for the cow-calf enterprise in comparison to the feedlot operations, and producers are affected more by price changes than cost changes. With calf prices generally inversely related to feed costs it was felt that stabilizing the price was more important; hence, price should be the major component in the support formula. This approach recognises that price is a reliable proxy for profitability in the cow-calf sector. The Index Moving Average Price approach is relatively straight forward and there is no need to estimate costs. Through the indexing of the 10-year average price, an adjustment is made for the impact of inflation on cash costs and implicitly on the return to the operator's labour, management and capital.

2.4. PRICE CALCULATION

The national average market price of feeder calves is a weighted average annual market price. Regional prices are collected for 400-600 pound graded steer calves and 400-500 pound graded heifer calves sold at the Toronto, Winnipeg, Saskatoon and Edmonton public stockyards for September to December as reported in the Canadian Livestock and Meat Trade Report, Market Information Service, Agriculture Canada.[1] These regional prices are weighted by the provincial distribution of beef cow numbers as reported by Statistics Canada in the January inventory of beef cow number.[2] In the West, the cow inventory numbers of BC and Alberta are used to weight Edmonton prices. Saskatchewan and Manitoba cow inventory numbers are used to weight Saskatoon and Winnipeg prices respectively. In the East, the combined cow inventory numbers of Ontario, Quebec and the Maritimes are used to weight Ontario prices.

[1] This report is chosen because it reports sales prices at major stockyards, provides the necessary historical data series and is published on a regular basis.

[2] Catalogue # 23-203. Since producers register their beef cow numbers in January, inventory numbers as of January 1 for the specific year were chosen for the model.

2.5. PAYMENT CALCULATION

Although the support level is initially calculated on a per hundred live weight of calf basis, it is converted to a per cow basis in determining actual payment. The conversion is based on the assumption of a weaning rate of 90% and weaning weights of 450 pounds and 500 pounds for heifers and steers, respectively.

Payment per cwt of calf = support price per cwt of calf - national weighted average price for the year

Payment per cow = payment per cwt of calf X 0.90 X (5.00 + 4.50)/2

= Payment per cwt of calf X 4.275.

A summary of stabilization calculations over the period 1976 to 1986 is presented below:

STABILIZATION CALCULATIONS FOR COW-CALF PROGRAM ($/CWT OF CALF)

YEAR	NATIONAL PRICE	DEFLATOR	DEFLATED PRICE	INDEXED MOVING AVERAGE PRICE	SUPPORT	PAYOUT
1976	33.09	64.65	51.19	54.03	45.93	12.84
1977	42.07	69.00	60.97	56.00	47.60	5.54
1978	81.58	72.83	112.02	58.06	49.35	
1979	100.50	79.48	126.45	66.34	56.39	
1980	85.71	88.05	97.34	76.49	65.02	
1981	69.41	97.58	71.14	85.55	72.71	3.30
1982	76.36	106.63	71.62	91.08	77.42	1.05
1983	80.27	113.00	71.04	93.41	79.40	
1984	83.53	117.28	71.22	91.17	77.49	
1985	83.38	120.58	69.15	94.81	80.59	
1986	100.46	124.30	80.82	99.71	84.75	
1987	120.09	129.53	92.72	107.74	91.57	

Notes: DEFLATOR = Gross Domestic Product Implicit Price Index
DEFLATED PRICE = National Price / (Deflator/100)
INDEXED MOVING AVERAGE Price = 10 year average of Deflated Price X (GDP/100)
SUPPORT = 85% X IMA Price
PAYOUT = Support - National Price if positive

3.0 SLAUGHTER CATTLE MODEL

3.1. CHARACTERISTICS OF SLAUGHTER CATTLE SECTOR

Feedlot finishing of cattle is an important part of beef production. The feedlot operator has several sources of feeder cattle. Usually, cattle are purchased through feeder sales, regular auction sales or by private arrangements. The operator takes the young calves from the cow-calf producer, and through heavy grain feeding, markets them at finished weights (between 1000 to 1200 pounds) the following spring and summer (15-18 months of age). Alternatively, the animal can be overwintered with roughage, grazed in the summer and finished with grain (between 16-30 months of age).

3.2. SCOPE OF SLAUGHTER CATTLE MODEL

The national tripartite stabilization program for slaughter cattle uses a quarterly "guaranteed margin" (GM) formula to establish support levels from which payments to producers are calculated. The "support price" equals the current quarter cash costs plus 90 percent of the difference or "margin" between the national average

prices and national average cash costs for the same quarter in each of the previous five years.[1] The price and cost model used to generate support levels is designed to reflect current industry structure and production methods in the slaughter cattle industry.

3.3. RATIONALE FOR GUARANTEED MARGIN (GM)

Variations in cash costs, in particular the costs of feeder animals, feed and interest, have a major impact on the financial position of cattle feeders. This margin (amount producers are guaranteed above cash costs) can be estimated in advance. Since the guaranteed margin is computed from market trends longer market signals are incorporated in the calculations. Support levels are based on price and cost differences so that price and cost changes are more important than absolute levels. Hence, the consistency of the measurement of cash cost is much more critical than the absolute cost estimates. Imputations of returns to the operator's labour, management and capital are arbitrary and imprecise and, therefore, subject to considerable debate. The guaranteed margin approach does not require such imputations. The margin is the return to unspecified items of cash cost as well as to land, management and capital.

[1] The average cash cost of production includes the following items: feeder animal, feed, interest, trucking and selling costs.

3.4 PRICE CALCULATION

The national average market price of slaughter cattle is (a weighted average of a blend of Grades A, B, and C slaughter cattle prices) calculated by using 96% of the A1, A2 rail grade prices converted to live weight equivalent prices, assuming a 58.5% dressing percentage for steers and a 57% dressing percentage for heifers[1]. Prices are those for Alberta, Saskatchewan, Manitoba and Ontario as reported in the Canada Livestock and Meat Trade Report, Agriculture Canada ("blue book")[2]. The prices are weighted by the federally inspected slaughter volume of steers and heifers as reported in the "blue book". In the west, Alberta and BC slaughter volumes are used to weight Alberta prices; Saskatchewan and Manitoba slaughter volumes to weight Saskatchewan and Manitoba prices respectively, while in the east, Ontario, Quebec and the Atlantic provinces combined slaughter volumes are used to weight Ontario prices.

[1] The 96% factor is used to reflect the average market price for all cattle including the A,B and C grades.

[2] Alberta and Ontario direct to packer sales rail grade prices, Saskatchewan stabilization board rail grade prices and Manitoba beef commission rail grade prices.

3.5 COST CALCULATION

The cost of production model is a monthly oriented model which generates the various budgets using average price, cost or index for each month. The costs calculated for a particular period refer to the costs of bringing a specific animal to market. Therefore, costs in a specific quarter for each animal type relates to the length of time that particular type of animal is on feed. Since the costs are computed on a monthly basis, monthly time periods relating to the feeding periods are assumed.

The national average cash cost is the weighted average cash cost of raising short and long keep steers and heifers in the east and west[1]. Cash costs of production in the slaughter cattle model are first calculated on a regional basis for each cattle type, long/short keep steers/heifers. These cash costs are then weighted by federally inspected slaughter in fixed proportion to the short and long keep cattle produced. Costs include the purchasing of feeder animals, feed, interest, trucking and selling costs. While most costs are the actual cash costs, trucking and selling costs are taken from indexed series using a base period of 1986Q3. The cost of production model is described in more detail in the following pages.

[1] See weighting factors on page 13.

3.5.1. Animal Classification

- Slaughter Animals

The following values are used for beginning weight, final weight, total gain, days on feed and average daily gains in the computation.

TABLE 1. CATTLE PERFORMANCE CRITERIA

	Purchase Weight (-------	Shrunk Weight lbs	Net Gain -------)	Number Days on Feed	Net Average Daily Gain (--lbs--)
Eastern Canada					
Long Keep Steers	500	1125	625	266	2.35
Long Keep Heifers	450	1000	550	268	2.05
Short Keep Steers	825	1200	375	136	2.75
Short Keep Heifers	750	1100	350	143	2.45
Western Canada					
Long Keep Steers	500	1125	625	240	2.60
Long Keep Heifers	450	950	500	217	2.30
Short Keep Steers	825	1200	375	107	3.50
Short Keep Heifers	750	1075	325	94	3.46

Source: Cattle Cost Model Sub-Committee Report

- Weighting Factors

The following weighting factors are used to determine the relative slaughter volumes of the long keep and short keep cattle for each quarter in the east and west.

TABLE 2. ASSUMED MARKETING DISTRIBUTION

	Long Keep		Short Keep	
	East	West	East	West
Quarter 1	20	20	80	80
Quarter 2	20	80	80	20
Quarter 3	80	50	20	50
Quarter 4	50	20	50	80

Source: Cattle Cost Model Sub-Committee Report

3.5.2. COST COMPONENTS

3.5.2.1. Feeder Animals

All the feeder prices are weighted by slaughter volumes; in the west, Alberta prices are weighted by both Alberta and BC slaughter volumes; Saskatchewan and Manitoba by Saskatchewan and Manitoba slaughter volumes respectively. In the east, the combined slaughter volumes in Ontario, Quebec and the Atlantic provinces are used to weight Ontario prices.

3.5.2.1.1. Long Keep

In the west, feeder prices for long keep steers are the weighted average prices of 400-500lb and 500-600lb steer calves from sales at public stockyards in Edmonton, Saskatoon and Winnipeg; heifer prices are the weighted average prices of 400-500lb heifer calves sold at the same markets. In the east, prices are calculated assuming that 60% of feeder calves are bought from the west and 40% are bought in eastern markets. That is, the simple average weighted western price (Edmonton, Saskatoon and Winnipeg) plus rail transportation cost between Moose Jaw and Toronto and the weighted average prices of the 400-500lb and 500-600lb steer and the 400-500lb heifer calves sold at the Toronto stockyard are weighted 60% and 40% respectively.

3.5.2.1.2. Short Keep

Short keep feeder prices are the weighted average prices of the 800-900lb steers and 700-800lb heifers sold at the Edmonton, Saskatoon and Winnipeg public stockyards in the west. In the east they are the weighted average prices of the same categories of feeders sold at the Toronto public stockyard.

3.5.3.1. Feed

Feed rations are formulated by Alberta Agriculture for the west and Ontario Ministry of Agriculture and Food (OMAF) for the east according to current industry standards of energy and protein levels. The feed rations are comprised of barley grain and silage for the west and corn grain and silage for the east supplemented by a 32% beef supplemnet, minerals and salt. The average nutrient content of the various feed components were determined at the respective provincial feed testing laboratories.

3.5.3.2. Feed Ration (kg)

TABLE 3A. TOTAL FEED INTAKE (KILOGRAMS) [1]

	Long Keep		Short Keep	
Components	Steers	Heifers	Steers	Heifers
Eastern Canada				
Corn Silage	3,618	2,939	1,852	1,173
Corn Grain	860	959	680	966
Supplement 32%	210	122	87	24
Minerals	7.16	8.7	13.5	18.1
Salt	0.7	1.9	1.1	1.8
Western Canada				
Barley Silage	2,024	938	470	462
Barley Grain	1,334	1,235	1,042	925
Supplement 32%	51	46	22	19
Minerals	4.9	6.9	5.9	5.4
Salt	7.5	4.2	3.5	3

Note: Developed based on performance criteria

[1] The values in this table are calculated by multiplying the number of days times the pounds of ration fed per day. An example is illustrated in the appendix.

TABLE 3B. TOTAL FEED INTAKE (POUNDS)

Components	Long Keep		Short Keep	
	Steers	Heifers	Steers	Heifers
Eastern Canada				
Corn Silage	7,976	6,479	4,083	2,586
Corn Grain	1,896	2,114	1,499	2,130
Supplement 32%	463	269	192	53
Minerals	15.8	19.2	29.8	39.9
Salt	1.5	4.2	2.4	4.0
Western Canada				
Barley Silage	4,462	2,068	1.036	1,019
Barley Grain	2,941	2,723	2,297	2,039
Supplement 32%	112	101	49	42
Minerals	10.8	15.2	13.0	11.9
Salt	16.5	9.3	7.7	6.6

Note: Developed based on performance criteria

3.5.3.3. Feed Prices

Eastern

Corn Grain	-	Ontario Farm Price Survey, Statistics Canada (market value)
Corn Silage	-	Corn silage Cash Cost of Production, Ontario Ministry of Agriculture and Food (OMAF)
Supplement	-	OMAF (market value)
Salt	-	$0.26/kg (1986q4 market value)
Mineral	-	$0.37/kg (1986q4 market value)

Western

Barley Grain	-	Alberta Farmgate Price Livestock Feed Board (market value)
Barley Silage	-	Barley silage Cash Cost of Production, Alberta Agriculture
Supplement	-	Alberta Agriculture (market value)
Salt	-	$0.26/kg (1986q4 market value)
Mineral	-	$0.08/kg (1986q4 market value)

3.5.3.4. Other Cost Components

3.5.3.4.1 Interest

The principal cost component is the expenditure related to the purchases of feeder calves. Interest costs are therefore calculated only for these purchases. The interest rate used is the monthly average of the chartered bank prime rate plus 1%. The duration of time used for calculating interest costs is the preceding 9 months for long keep cattle in the east, 8 and 7 months for long keep steers and heifers respectively in the west, 5 months for short keep cattle in the east and 4 and 3 months for short keep steers and heifers respectively in the west. Most of the feeder calves come from the western provinces. The stress on these calves during transfer from the west to east causes them to lose some weight and additional days of feeding would be required for the calves to recover this weight loss, hence the longer feeding period in east.

3.5.3.4.2 Trucking

Trucking charges[1] are $4.00 and $7.00 for transportation in and out of the farm respectively in the east while in the west the cost is $6.00 and $12.00 for transportation in and out of the farm respectively. These charges are indexed by the Machinery and Motor Vehicle Operations Index for east and west which has been normalized to equal 1.0 by 1986Q1 index. Cost of transporting calves to the farm is accounted for in the feeder cost.

3.5.3.4.3 Selling cost

Marketing charges are the yardage and commissions on a per head basis. These costs are calculated on the basis of 0.25% and 0.7% of the slaughter prices in the west and east respectively.[2] These costs are indexed by the services excluding shelter component of the Consumer Price Index.

[1] Trucking charges are determined by the Cattle Cost Model Sub-Committee.
[2] These percentages are determined by the Model Sub-Committee.

3.6. PAYMENT CALCULATION

In any quarter that the market price falls below the support price, the stabilization payment per hundredweight of cattle is equal to the support price for that quarter less the weighted national average price in that quarter. This payment is paid to cattle marketed during that quarter that are graded A,B or C and which have been owned by a producer for at least 60 days.

Support Price for quarter(t) = Cash Cost for quarter(t) + { 0.90 X [Avg. Price - Avg. Cost of quarter(t) of previous 5 years]}

Payment per animal for quarter(t) = Support Price - National Weighted average price for the specific quarter.

A summary of stabilization calculations is appended:

YEAR/QTR	NATIONAL AVERAGE PRICE	NATIONAL AVERAGE COST	5-YEARS AVERAGE PRICE	5-YEARS AVERAGE COST	SUPPORT LEVEL	PAYOUT
	($/CWT)					
81Q1	73.82	67.82	52.73	44.10	75.58	1.76
81Q2	75.72	66.17	56.97	43.57	78.23	2.51
81Q3	72.76	65.91	56.37	46.00	75.24	2.48
81Q4	69.35	65.44	58.30	49.95	72.96	3.61
82Q1	67.95	61.60	60.05	51.00	69.75	1.80
82Q2	79.09	56.73	64.14	50.58	68.94	.
82Q3	73.26	56.76	63.71	52.63	66.74	.
82Q4	68.46	61.47	64.97	56.24	69.33	0.87
83Q1	70.27	61.07	66.70	56.97	69.83	.
83Q2	75.38	58.14	72.27	55.87	72.90	.
83Q3	68.83	58.70	70.35	57.73	70.05	1.22
83Q4	71.34	63.21	70.09	61.81	70.66	.
84Q1	76.95	61.90	71.85	62.21	70.58	.
84Q2	76.75	62.04	75.45	60.71	75.31	.
84Q3	75.46	64.41	72.24	61.79	73.81	.
84Q4	77.48	66.12	72.08	64.60	72.85	.
85Q1	78.15	65.95	72.72	63.89	73.90	.
85Q2	74.82	65.08	75.33	62.07	77.01	2.19
85Q3	67.42	64.48	72.99	62.33	74.07	6.65
85Q4	76.57	64.72	72.90	64.19	72.56	.
86Q1	72.61	64.33	73.43	63.67	73.11	0.50
86Q2	70.27	61.92	76.35	61.63	75.17	4.90
86Q3	75.21	61.37	71.55	62.05	69.92	.
86Q4	79.74	63.62	72.64	64.19	71.22	.
87Q1	77.32	66.06	73.19	62.97	75.25	.
87Q2	83.99	65.52	75.26	60.78	78.56	.
87Q3	81.87	68.09	72.04	61.14	77.89	.
87Q4	80.80	72.51	74.72	63.83	82.32	1.51

4.0 FEEDER CATTLE MODEL

4.1. CHARACTERISTICS OF FEEDER CATTLE SECTOR

The "backgrounding" operation is a part of the beef production process where the farmer overwinters his calves on roughage and with summer grazing, sells the animals at between 800 to 1000 pounds the next fall as heavy feeders. The output from this operation is taken in the fall as heavy feeders and marketed after 3 to 4 months of feeding on mainly grains. The animals sold from this phase of production are commonly known as feeder cattle (backgrounders).

4.2. SCOPE OF FEEDER CATTLE MODEL

The feeder cattle stabilization program is a quarterly program based on the Guaranteed Margin Approach. The support level for a quarter is defined as the cash costs for the quarter plus 90 percent of the average margin in the same quarter in the preceding five years. The margin for any quarter is the weighted national average price for that quarter minus the weighted national average cash costs in the quarter. If the weighted national average market price for a quarter is below the support level for that quarter, a payment is effected.

4.3. PRICE CALCULATION

The national market price of feeder cattle sold is a weighted average price of heavy feeder heifers weighing 700 to 800 pounds and heavy feeder steers weighing 800 to 900 pounds sold at Edmonton, Saskatoon, and Winnipeg for the west and at Toronto for the east during that quarter. The volumes of sales of feeder cattle represent the volumes of purchase of feeders in the short keep budgets in the slaughter cattle model and the national market price is weighted by these volumes.

4.4. COST CALCULATION

The main cash cost included in the cash costs of production is the purchase cost of 400-500 pound heifer and 400-600 pound steer calves. This cost is calculated from feeder calf prices in the Edmonton, Saskatoon, Winnipeg and Toronto markets and represents the simple average of the last three quarters weighted average prices immediately preceding the quarter of purchase. This is based on the assumption that an animal which is sold in the current quarter was the result of a calf purchased the previous, or two, or three quarters before. For example, in the fourth quarter the feeder calf prices are calculated using 1/3 based on the preceding 1st quarter, 1/3 on the preceding 2nd quarter and

preceding 3rd quarter weighted prices. The weight gain of feeder cattle is approximate 75% of that of slaughter hence, the remaining cash costs are calculated at 75 percent of the other costs, on a per pound of gain basis, for raising long keep cattle in the slaughter cattle model. These cash costs are weighted by the volumes of sales of short keep cattle.

A summary of stabilization calculations over 1981Q1 to 1987Q4 is presented below:

Stabilization Calculations for Feeder Cattle (GM)

YEAR/QTR	NATIONAL AVERAGE PRICE	NATIONAL AVERAGE COST	5-YEARS AVERAGE PRICE	5-YEARS AVERAGE COST	SUPPORT LEVEL	PAYOUT
	($/CWT)					
81Q1	75.02	64.41	54.83	44.36	73.83	.
81Q2	76.13	64.61	60.05	46.03	77.23	1.10
81Q3	71.38	65.32	58.74	48.58	74.46	3.08
81Q4	67.03	62.07	58.45	50.26	69.44	2.41
82Q1	64.48	59.17	62.84	51.50	69.37	4.89
82Q2	74.64	56.75	67.16	52.91	69.57	.
82Q3	73.74	57.83	66.13	55.43	67.46	.
82Q4	70.15	59.08	65.63	56.48	67.31	.
83Q1	73.21	60.16	69.10	57.31	70.77	.
83Q2	76.01	60.79	74.30	58.13	75.34	.
83Q3	71.30	61.13	73.23	60.90	72.23	0.92
83Q4	70.57	62.03	71.80	61.93	70.92	0.36
84Q1	75.98	62.99	74.89	62.72	73.94	.
84Q2	75.93	64.06	77.14	63.04	76.75	0.82
84Q3	74.57	65.23	74.43	64.76	73.93	.
84Q4	75.40	65.46	72.49	64.48	72.67	.
85Q1	76.91	65.62	73.76	64.06	74.35	.
85Q2	78.95	65.95	75.15	63.15	76.75	.
85Q3	72.04	66.13	73.26	63.63	74.81	2.76
85Q4	76.14	65.39	72.00	62.72	73.73	.
86Q1	76.55	64.77	73.12	62.47	74.35	.
86Q2	76.84	64.61	76.33	62.43	77.13	0.29
86Q3	79.40	66.21	72.61	63.13	74.74	.
86Q4	81.34	68.38	71.86	62.81	76.52	.
87Q1	85.43	70.67	73.42	62.54	80.47	.
87Q2	90.55	73.09	76.48	62.43	85.73	.
87Q3	93.79	77.11	74.21	63.31	86.92	.
87Q4	90.45	80.14	74.72	64.07	89.73	.

5.0 CONCLUDING REMARKS

The primary use of the cattle models is to generate stabilization calculations for the Red Meats National Tripartite Stabilization Program for cattle. To this end, the models which were recently revised, are meeting the objectives. With changing technologies and production practices, it is important that the models reflect these phenomena. Updating and revision of these models will be carried out on a continual basis such that changes in the industry are incorporated. Performance of the models will be closely monitored to ensure that objectives of the National Tripartite Stabilization Programs are met.

REFERENCES:

Agriculture Canada, Proposed Tripartite Red Meat Stabilization Program, January, 1985.

APPENDIX

Background to the Feeding Budgets:

Feed rations have been formulated such that the energy levels used are NRC requirements plus 10% and protein levels are as recommended in the NRC Beef Requirements, by Alberta Agriculture and OMAF. In some rations the protein level fed will exceed NRC requirements since the feeding programs assume that Rumensin/Bovatec is provided with the protein supplement. The total feed required is on pay weight to pay weight basis with the following assumptions:

a) the final weight is to be a shrunk weight.

b) the number of days (as part of the days on feed) needed to recover purchase weight is:

i) 24 days for Eastern fed calves

ii) 15 days for Western fed calves

iii) 10 days for short keep animals;

and during this time the cattle are fed no grain.

c) the feeding programs are done in approximately 200lb increments (i.e. 3 different rations for long keeps and 2 for short keeps) in addition to the feed needed to recover purchase weight.

d) no allowance is made for death loss.

e) all animals are assumed to have been implanted and fed Rumensin/Bovatec throughout to feeding period.

f) type of animal used is the large frame/compensating medium frame

The Western Ration is prepared by Alberta Agriculture

APPENDIX TABLE 1. PERFORMANCE SUMMARY (WESTERN CATTLE)

	Wt. Range	Average Wt. For Period	ADG	Days	Gain
	(---------- lb ----------)			#	(lb)
	Start-Up	500	-	15	-
Longkeep	500- 700	600	2.5	80	200
Steers	700- 900	800	2.75	73	200
	900-1125	1012	3.12	72	225
			---	---	---
			2.60*	240	625
	Start-Up	450	-	15	-
Longkeep	450- 650	550	2.2	91	200
Heifers	650- 850	750	2.7	74	200
	850- 950	900	2.7	37	100
			---	---	---
			2.3*	217	500
	Start-Up	825	-	10	-
Shortkeep	825-1025	925	3.86	52	201
Steers	1025-1200	1112	3.86	45	174
			---	---	---
			3.50*	107	375
	Start-Up	750	-	10	-
Shortkeep	750- 950	850	3.87	52	201
Heifers[1]	950-1075	1012	3.87	32	124
			---	---	---
			3.46*	94	325

* Weighted Average Daily Gain

[1] These requirements are taken from Alberta Allowance, Alberta Agriculture as NRC does not cover this range.

APPENDIX TABLE 2. ANALYSIS OF FEEDS USED (AS FED BASIS) (WESTERN RATION)

	DM %	D.E. (Mcal/lb)	Protein (%	Calcium %	Phosphorus %)
Barley Grain	87.8	1.46	11.0	0.06	0.31
Silage	36.4	0.46	4.4	0.17	0.08
32% Supplement	90.0	1.10	32.0	5.00	1.0
Limestone	100.0	0	0	38.00	0

(Source: Average Analysis of Alberta Feeds, Alberta Agriculture)

APPENDIX TABLE 3. WESTERN FEED REQUIREMENTS

	Period	ADG	Wt. Range lb	D.E.[1] Mcal	Protein[1] lb	Calcium[1] lb	Phosphorus[1] lb
	Start-Up	0	500- 500	-	-	-	-
Longkeep	1	2.50	500- 700	22.0	1.81	0.076	0.037
Steers	2	2.75	700- 900	28.1	2.01	0.075	0.043
	3	3.12	900-1125	34.7	2.2	0.076	0.047
	Start-Up	0	450- 450	-	-	-	-
Longkeep	1	2.2	450- 650	18.9	1.55	0.068	0.033
Heifers	2	2.7	650- 850	26.9	1.75	0.062	0.036
	3	2.7	850- 950	30.8	1.85	0.057	0.040
	Start-Up	0	825- 825	-	-	-	-
Shortkeep	1	3.86	825-1025	35.6	2.24	0.084	0.048
Steers	2	3.86	1025-1200	40.6	2.30	0.078	0.051
	Start-Up	0	750- 750	-	-	-	-
Shortkeep	1	3.87	750- 950	37.5	2.5	0.05	0.035
Heifers	2	3.87	950-1075	42.4	2.7	0.05	0.035

(Source 1984 NRC Beef)
- No requirements used for start-up, assume silage fed at 2% of body weight on a dry matter basis.

[1] NRC '84 Beef requirements plus 2% (i.e. NRC plus 10% less 8% energy reduction for Rumensin/Bovatec)

APPENDIX TABLE 4. RATIONS - POUNDS/HEAD/DAY (AS FED BASIS)
(WESTERN CATTLE)

	Start-Up	Period 1	Period 2	Period 3
Longkeep Steers				
ADG (lbs)	0	2.5	2.75	3.12
Barley Silage	27.5	30.5	15	7
Barley Grain	-	5.0	14.0	21.0
32% Beef Supplement	-	0.5	0.5	0.5
Limestone	-	0	0.05	0.1
Salt	-	0.06	0.08	0.08
TOTAL	27.5	36.06	29.63	28.68
Longkeep Heifers				
ADG (lbs)	0	2.2	2.7	2.7
Barley Silage	24.7	12.5	5	5
Barley Grain	-	8.8	16.4	19.0
32% Beef Supplement	-	0.5	0.5	0.5
Limestone	-	0.06	0.08	0.1
Salt	-	0.03	0.06	0.06
TOTAL	24.7	21.49	22.04	24.66
Shortkeep Steers				
ADG (lbs)	0	3.86	3.86	
Barley Silage	45.3	6	6	
Barley Grain	-	22.0	25.5	
32% Beef Supplement	-	0.5	0.5	
Limestone	-	0.12	0.15	
Salt	-	0.08	0.08	
TOTAL	45.3	28.70	32.23	
Shortkeep Heifers				
ADG (lbs)	0	3.87	3.87	
Barley Silage	41.2	7	7.5	
Barley Grain	-	23.0	26.2	
32% Beef Supplement	-	0.5	0.5	
Limestone	-	0.13	0.16	
Salt	-	0.08	0.08	
TOTAL	41.2	30.71	34.44	

(N/B All rations are calculated to contain Ca:P of no less than 1.25:1)

Tables in the text were developed from the various appendix tables. For example, in Table 3B (page 6) it is noted that 2,941 pounds of barley grain are fed to long keep steers in the west. This amount is calculated from appendix tables 1 and 4 above. Appendix table 1 shows that period 1 was 80 days in duration while periods 2 and 3 were 73 days and 72 days respectively. Appendix table 4 indicates that 5, 14 and 21 pounds of barley grain were fed in each of periods 1, 2 and 3 with none in the start up period. Therefore the total amount of feed required for feeding a calf to slaughter weight in the west equals to:

(80 X 5) + (73 X 14) + (72 X 21) = 2,934 lbs.

The difference of 7 pounds between the calculated value and that shown in Table 3B is due to minor rounding.

The Eastern Ration is prepared by Ontario Ministry of Agriculture and Food (OMAF)

APPENDIX TABLE 5. PERFORMANCE SUMMARY (EASTERN CATTLE)

	Wt. Range	Average Wt. For Period (lb)	ADG (lb)	Days #	Gain (lb)
Longkeep Steers	Start-Up			24	-
	500- 700	600	2.25	89	200
	700- 900	800	2.8	72	200
	900-1125	1042	2.8	81	225
			2.35*	266	625
Longkeep Heifers	Start-Up			24	-
	450- 600	525	2.0	75	150
	600- 800	700	2.3	86	200
	800-1000	925	2.4	83	200
			2.05*	268	550
Shortkeep Steers	Start-Up		-	10	-
	825-1025	925	3.0	67	200
	1025-1200	1142	3.0	59	175
			2.75*	136	375
Shortkeep Heifers	Start-Up		-	10	-
	750- 950	850	2.6	77	200
	950-1100	1050	2.7	56	150
			2.45*	143	350

* Weighted Average Daily Gain.

APPENDIX TABLE 6. ANALYSIS OF FEEDS USED (AS FED BASIS) (EASTERN RATION)

	DM %	TDN	Protein	Calcium	Phosphorus
		(------ As a % of Dry Matter ------)			
Corn Silage	35.00	67.0	8.00	0.26	0.22
Grain	86.00	90.0	10.10	0.08	0.32
32% Supplement	92.00	73.3	34.80	2.70	0.82
Co I Salt	96.00	-	-	-	-
18:9 Mineral	96.00	-	-	18.70	9.40

(Source: Average Analysis of Ontario Feeds, OMAF)

APPENDIX TABLE 7. EASTERN FEED REQUIREMENTS

	Period	ADG	Wt. Range	TDN lb	Protein	Calcium	Phosphorus
		(----------			----------		----------)
	Start-Up	1.50	500- 500	8.00	1.40	0.052	0.028
Longkeep	1	2.25	500- 700	10.70	1.81	0.076	0.037
Steers	2	2.80	700- 900	14.20	2.07	0.080	0.044
	3	2.80	900-1125	17.10	2.21	0.075	0.048
	Start-Up	1.50	450- 450	7.80	1.28	0.049	0.025
Longkeep	1	2.0	450- 650	9.50	1.53	0.062	0.032
Heifers	2	2.3	650- 850	12.55	1.68	0.062	0.036
	3	2.4	850- 950	15.70	1.80	0.056	0.040
	Start-Up	2.0	825- 825	12.95	1.84	0.063	0.040
Shortkeep	1	3.0	825-1025	15.50	2.19	0.082	0.049
Steers	2	3.0	1025-1200	17.60	2.30	0.079	0.052
	Start-Up	2.0	750- 750	12.30	1.64	0.053	0.035
Shortkeep	1	2.6	750- 950	15.10	1.81	0.065	0.042
Heifers	2	2.7	950-1075	17.70	1.89	0.055	0.040

(Source 1984 NRC Beef)

(N/B - Energy allowance = NRC '84 Beef requirement plus 2% i.e. NRC + 10% less 8% energy reduction for Rumensin/Bovatec)

APPENDIX TABLE 8. RATIONS - POUNDS/HEAD/DAY (AS FED BASIS) (EASTERN CATTLE)

	Start-Up	Period 1	Period 2	Period 3
Longkeep Steers				
ADG (lbs)	1.5	2.35	2.05	2.45
Corn Silage	30.5	32	31	26.5
Corn Grain	-	2.5	8.0	13.5
32% Beef Supplement	1.79	2.5	1.6	1.0
CoI Salt	-	-	0.01	0.01
18:9 Mineral	-	-	0.05	0.15
TOTAL	32.29	37.0	40.66	41.16
Longkeep Heifers				
ADG (lbs)	1.5	2.0	2.3	2.4
Corn Silage	30.0	22.0	23.5	25.0
Corn Grain	-	4.5	8.45	12.6
32% Beef Supplement	1.45	1.7	1.0	0.25
CoI Salt	-	-	0.024	0.024
18:9 Mineral	-	0.02	0.09	0.12
TOTAL	31.45	28.22	33.064	37.994
Shortkeep Steers				
ADG (lbs)	2.0	3.0	3.0	
Corn Silage	53.4	29.5	26.5	
Corn Grain	-	10.0	14.0	
32% Beef Supplement	1.21	1.7	1.1	
Co I Salt	-	-	0.04	
18:9 Mineral	-	0.18	0.30	
TOTAL	54.61	41.38	41.94	
Shortkeep Heifers				
ADG (lbs)	2.0	2.6	2.7	
Corn Silage	51.9	15.5	15.5	
Corn Grain	-	14.5	18	
32% Beef Supplement	0.71	0.4	0.25	
Co I Salt	-	0.03	0.03	
18:9 Mineral	-	0.3	0.3	
TOTAL	52.61	30.73	34.08	

(N/B All rations are calculated to contain Ca:P of no less than 1.2:1. When no salt is shown for a period allotment, enough was available from the supplement and mineral provided.)

A comparison of the approximate feed energy (Mcal of DE) required per pound of gain for each program is as follows:

	Alberta	Ontario
Longkeep Steers	10.3	11.4
Longkeep Heifers	10.0	11.9
Shortkeep Steers	10.3	11.8
Shortkeep Heifers	10.7	13.0

The differences in feed efficiency are due to lower daily gains and longer feeding periods in the Ontario feeding programs. Hence, a higher percentage of the feed will be required for animal maintenance in the Ontario ration than the Alberta ration.

LIST OF WORKING PAPERS PUBLISHED IN 1988

No. 1 Financing Production and Surplus in the Canadian Egg Industry. Michael Katz. June 1987.

No. 2 The National Tripartite Stabilization Program for Red Meats: Cattle Models. M.H. Tan. March 1988

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