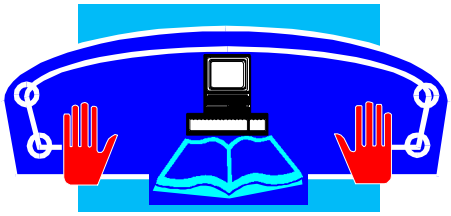

An Evaluation Of The Potential For Small-flock Egg Production At Selected Points In The Nwt

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MEMORANDUM :

AN EVALUATION OF THE POTENTIAL FOR SMALL-FLOCK EGG PRODUCTION AT SELECTED POINTS IN THE N.W.T.

Prepared for the
Department of Economic Development and Tourism
Government of The Northwest Territories

S.C. 256769

ROYGOLD MARKETING SYSTEMS LTD.
1870 Barnhart Place
Ottawa, Ontario, KIH 5B6

August 18, 1987

EXECUTIVE SUMMARY

MEMORANDUM: AN EVALUATION OF THE POTENTIAL FOR SMALL-FLOCK EGG PRODUCTION AT SELECTED POINTS IN THE N.W.T.

The economic feasibility of a small scale egg production in Inuvik, Cambridge Bay, Frobisher Bay, Rankin Inlet, and Norman Wells was examined. Potential markets indicate the feasibility of flocks between 500 and 1500 birds for local markets and between 1000 and UP to 3400 birds on a regional market basis.

Prospects for Frobisher-Bay and Norman Wells appear the most promising, with Rankin Inlet and Cambridge Bay possibilities of declining prioritiy. A flock in Inuvik may not be economically feasible owing to ease of supply either from Hay River or Whitehorse.

Operators could earn in excess of $250 per week for small scale operations of 500 bird flocks. But incentives would likely be required to assist with capital inputs and the acquisition of production expertise.

AN EVALUATION OF THE POTENTIAL FOR SMALL-FLOCK EGG PRODUCTION AT SELECTED POINTS IN THE N.W.T.

1.0 BACKGROUND

The development option of establishing small layer flocks in outlying areas of population concentration has been raised as a means of improving local food supplies, generating local economic activity and responding to potential economic opportunity. It was felt that small flocks might be easily accommodated within existing physical facilities which might not be currently used, and provide gainful employment for individuals which might not otherwise be available in these areas. Flock size would be expected to be 2000 layers or less. It is anticipated that such operations would be considered to be unregulated production for local use and would not be subject to regulations and control by the Canadian Egg Marketing Agency. This permits direct Territories' action without reference to Federal authorities.

300

This examination is designed to assess the economic feasibility of local small-scale egg production in the North within the framework of data currently available from primary and secondary sources.

2.0 CONSIDERATIONS IN PROJECT DEVELOPMENT

A number of potential sites for such activity have been suggested. These sites are Inuvik, Rankin Inlet, Frobisher Bay, Cambridge Bay, Fort Simpson, and Norman Wells. These sites have been identified because they constitute population concentrations, and are key transportation centres

in the process of supplying other population centres which are more isolated. The following information has been gathered on these sites.

2.1 POTENTIAL MARKETS

2.1.1 Inuvik:

This town of 3166, at the last census, is about 1200 miles north of Yellowknife. In addition to local population, it supplies goods and services via road and air routes to:

Sacks Harbor	- 161 population	
Tuktoyaktuk	- 882 population	(137 kms north)
Arctic Red River	- 125 population	(100 kms south)
Fort McPherson	- 693 population	(121 kms south)
Aklavik	- 750 population	(58 kms south)
	2611 population	

Although Canadian per capita consumption totals approximately 18 dozen, fresh consumption is about 15 dozen. On this basis, fresh consumption in the primary market totals about 60 boxes of 15 each week. If we were to include the secondary market, this would rise by 50 boxes to 110 boxes weekly, Information from the trade* indicate that shipments actually approximate 150 boxes each week. However there is some question as to whether this figure is accurate.

These supplies are sourced primarily through Whitehorse consequent on air freight structures. Wholesalers in Whitehorse have succeeded in

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*Northern Poultry, Villetard Eggs

negotiating rates for bulk air freight shipment which are not available to shippers to Inuvik. The relationship between shipping costs in these places will be an important factor for potential economic activity in this centre. Shipping costs to Whitehorse are estimated as 10¢/dozen compared to 65$/dozen to Inuvik.

2.1.2 Rankin Inlet:

This town, with a population of 1315, has secondary markets as follows:

Baker Lake	- 1003 population	
Eskimo Point	- 1166 population	
Repulse Bay	- 402 population	
Igloolik	- 788 population	
Whale Cove	- 200 population	
Gjoa Haven	- 663 population	- (could be supplied from Cambridge Bay)
	4222 population	

The total secondary market, accessible essentially by air routes, totals 4522 persons. This market receives little if anything in the way of eggs. There are no reports of significant shipment. Assuming that the primary market could be filled, it would require about 25 boxes per week. If the secondary market was accessed, this could mean a market for 87 boxes per week, or a total of 112 boxes per week in this region.

2.1.3 Frobisher Bay:

The current population in the town is 2954. The marketing area includes the following areas:

Pond Inlet	- 808	population
Nanisiuk	- 288	population
Artic Bay	- 450	population
Broughton Island	- 410	population
Coral Harbor	- 455	population
Hall Beach	- 415	population
Lake Harbor	- 285	population
Pangnirtung	- 893	population
Resolute Bay	- 169	population
	4173	population

This primary market would consume 57 boxes of eggs per week and the secondary market 80 boxes of eggs per week, a total of 137 boxes. The secondary market could absorb about 3 pallets every two weeks.

2.1.4 Cambridge Bay:

This town has a population of 902 residents, with the following secondary market accessible by air:

Spence Bay	- 450	population
Bathurst Inlet	- 100	population
Ioolman	- 345	population
Pelly Bay	- 268	population
	1163	population

The primary market could consume 17 boxes and the secondary market about 22 boxes, ie. one pallet of 50 boxes every two weeks.

2.1.5 Fort Simpson:

This town 375 kilometers south west of Yellowknife, and accessible by road, has a population of 1102. Owing to its location near the MacKenzie Highway it is easily supplied from southern Canada or by a poultry operation in Hay River. The development of independant poultry facilities would be unlikely to be of economic interest.

2.1.6 Norman Wells:

This town, 684 kilometers north west of Yellowknife, has a population of 749. Some 145 kilometers to the north west is Fort Good Hope, with a population of 693, which, like Norman Wells, has summer barge access to Hay River, and extensive air contact to the south via Edmonton and Yellowknife. The major activity is oil extraction. Fort Norman, 523 kilometers to the south, with a population of 300 is even more accessible from Hay River. Prices in Norman Wells are reportedly (N.W. Data Book 1986-1987) 60% higher than in Yellowknife. This indicates a market in Norman Wells and Fort Good Hope of about 15 boxes weekly in each town or 30 boxes total.

2.2 FACTORS IN EGG PRODUCTION

The economic viability of localized egg production depends in this instance on relative cost of local egg production compared with the landed cost of southern production. Other factors include the physical possibility of pullet and feed supply, storage, maintenance, the availability of

reliable water supply and power, as well as experienced management and labour finding sufficient economic interest in maintaining an operation of the scale proposed.

2.3 SCALE AND PRODUCTION REQUIREMENTS

This proposal considers the development of units of “unregulated” production using units of 1000 to ,2000 layers. Such units have the capacity to produce on the average, 20 dozen per bird, or 20,000 to 40,000 dozen. This would yield 400 to 800 dozen per week on the average. Flocks or layers are normally placed all at the same time. Production would begin above this average and descend, during the production year, to below this average. Flocks are normally kept in production for 12 months. There is a predicable rate of mortality which varies with the management. A mortality of 1% a month would be a reasonable expectation under likely conditions. (Production level can be regenerated by a period of "moult" during wh ch production ceases for a period and then recommences for 6 - 9 months at a much higher level; or the flock can be totally replaced annually)

The cycle includes a period of 20 weeks at inception during which chicks are raised to the laying stage. The flock is best and most economically transported to the production site at the chick stage. Flocks could be kept loose or in cages. Caring for layers will be less costly, mortality lower, and production higher if birds are in cages, but capital

costs would be lower if the small flock is maintained loose.

A rough measure of space requirements would be one square foot per bird, but greater space would reduce mortality, and make maintenance easier in a loose operation. Reliable ventilation, lighting controls and clean water supplies are imperative.

2.4 MARKET PRICES

Below is a table showing shell egg prices, wholesale and retail, at various points in the Territories and in Edmonton.

Table 1

SHELL EGG MARKET PRICES, SELECTED POINTS, GRADE A LARGE, JULY, 1987

City	Wholesale Delivered	Retail in Store
Edmonton	$ 1.25	$ 1,45
Hay River	1.31	1.56
Yellowknife	1.36	1.55 to 1.60
Fort Simpson	1.36	1.60
Norman Wells	2.91	3.45
Cambridge Bay	2.60	2.92
Inuvik	1.75	2.09
Frobisher Bay	2.68	3.02
Rankin Inlet (est.)	2.68	3.02

It is obvious that the differential between egg prices in Edmonton and Hay River/Yellowknife, allow little room for independent local Territories production. Transport cost for eggs are too low. Only a substantially lower cost of production could justify local production. The availability of feed freight assistance for Territories' production, or other continuing reason for price differentials, are required to make Territories' production viable. The $50/ton transportation subsidy on 82% of the ration made up of western grain ·s the major factor permitting economic and competitive production in Hay River. Economies of scale in a large operation could be another

Local Territories production in outlying areas, vis a vis Hay River, would not, on the face of it, be economic if an effecient operation was established in Hay River. Eggs are cheaper to ship than the feed it takes to produce them. It takes about 4.2 pounds of feed to produce a pound and a half of eggs.

For outlying areas, a major factor which could encourage local production is availability. The absence of sufficient quantities of eggs can drive up the price sufficiently to make local production, in limited quantities, a viable proposition. The harsh climatic conditions mean that during significant portions of the year no product is available at any price. And this factor is most likely to be operative in the most outlying regions. The pricing table below reflects this situation

through egg price levels. Market conditions in Cambridge Bay, Frobisher Bay, and Norman Wells are the most promising.

The following table expresses the price relationship for eggs at the wholesale level between major northern points and Edmonton.

Table 2

WHOLESALE EGG PRICING DIFFERENTIAL,
SELECTED TERRITORIES POINTS VS EDMONTON

Centre	Absolute	Percentage
Inuvik	$ 0.50	% 140
Cambridge Bay	1.35	208
Frobisher Bay	1.48	214
Rankin Inlet	1.48	214
Norman Wells	1.66	232

2.5 FEED COSTS

The table following illustrates various approaches to feed ration and feed supply transport, expressed in cost per metric tonne, in Edmonton and various Territories points.

The relationship between the feed costs at Territories' points and Edmonton is shown in Table 4. The impact of the transport cost differentials on Territories' egg production costs is shown based on the assumption that the feed component makes up 40% of total production cost.

All other production cost components are assumed as similar to those in the south.

Table 3

POULTRY FEED, DELIVERED COST PER TONNE AT SELECTED POINTS, JULY, 1987

Centre	Prepared Feed bulk transport	Prepared Feed bagged transp.	Component Feeds bulk transp. grain
	- $ Per Tonne -		
Edmonton			
- truck	165.	190.	115.
Fort Simpson			
- truck	249.	300.	185.
- barge			
Norman Wells			
- barge	436.	405.	354.
Cambridge Bay			
- barge	790.	730.	711.
Inuvik			
- truck	382.	535.	513.
- barge	512.	499.	433.
Rankin Inlet			
- rail/barge	729.	694.	754.
Frobisher Bay			
- barge	634.	471.	577.

The final column in Table 4 shows the effect on all Territories' cost of production shown on the same basis as those feed costs. The higher cost differential is applied to all costs in a way identical to that for feed costs. The assumption is that transportation costs will increase all component costs in the same way it does for feed. This is a device to provide a surrogate for higher northern costs and smaller scale.

Table 4

FEED COST DIFFERENTIAL*, SELECTED TERRITORIES POINTS VS EDMONTON

		Production Costs Impact of Higher Feed Transport Cost			
Centre	Feed Cost	40% Feed Component Impact		100% Impact	
	$/Tonne	Differential ¢/dozen	Percentage	Differential d/dozen	Percentage
Inuvik					
- barge	$499	30.4	184	75.7	309
- truck	535	26.4	173	65.9	282
Cambridge Bay	730	41.3	214	103.0	384
Frobisher Bay	471	21.4	159	53.6	248
Rankin Inlet	694	38.4	206	95.9	365
Norman Wells	405	16.4	145	40.9	213

*A comparison of prepared feed bagged transport cost versus similar landed cost at Edmonton is used to minimize infrastructure and equipment costs for small-scale operations in the Territories.

The model used is based on a comparison of cost comparing feed transported in bagged form. In reality competitive suppliers of eggs are more likely to be productive using prepared feed, (bulk transported) or even component feed bulk transported. These alternatives are unlikely to be practical for small-scale production in outlying areas, however they are likely to apply to production in southern Canada. A comparison of this kind, bagged feed, compared with these other modes, would add 15-65% to the absolute or differential cost comparisons indicated in examining the competitiveness of localized small scale production. (In Tables 5 and 6 this important consideration is factored into northern production costs.)

Table 5

LOCAL PRICE MARGINS VS LOCAL FEED COST DIFFERENTIALS*
vs EDMONTON BY SELECTED NORTHERN CENTRES

Centre	Wholesale Price Margins vs Edmonton Grade A Large	Feed Cost Comparisons vs Edmonton		
		Bagged Prepared	Bulk Prepared	Component Bulk
	- cents per dozen -			
Inuvik				
- barge	50	30.4	35.0	50
- truck		26.4	30.0	44
Cambridge Bay	135	41.3	47.5	58
Frobisher Bay	148	21.4	25.0	30
Rankin Inlet	148	38.4	44.0	68
Norman Wells	166	16.4	19.0	27

* Differentials compare non-identical feed preparation approaches in northern centres vs Edmonton, bagged in the north, versus bulk prepared, and component bulk at Edmonton.

Based on this analysis, assuming costs other than feed are identical with those in southern Canada, an evaluation utilizing a bagged feed comparison, shows competitiveness for local production at all locations. More realistically, the comparison utilizes bagged feed in the north, and component feed preparation in the south. Here, the situation becomes marginal at Inuvik. If one takes into account the lower transport rates for shipments to Inuvik through Whitehorse, the possibilities for local production become even more difficult. Efforts of wholesalers in Whitehorse seeking to retain their market could make local production in Inuvik untenable, even if only trucked-in feed is used.

It is obvious, however, that assuming all "other" costs in the

north are comparable to those in the south cannot be supported as a reasonable assumption. Energy costs, and the cost of supplying water are obviously higher, as is shipping pullets by air. Physical plant will also be more costly as there are obviously higher costs associated with differences in plant and equipment unless facilities are subsidized. These must all exact a toll in costs. For this reason, it would be useful to examine the impact on relative competitiveness if the impact of the relatively higher cost for feed were generalized proportionately over all costs. Such an evaluation would, in any event, be useful as a form of sensitivity analysis. This comparison is shown in Table 6.

Table 6

EGGS: LOCAL WHOLESALE PRICE MARGINS AND ESTIMATED TOTAL LOCAL PRODUCTION COST DIFFERENTIALS* VS EDMONTON BY SELECTED NORTHERN CENTRES

Centre	Wholesale Price Margins vs Edmonton Grade A Large	Feed Cost Comparison vs Edmonton		
		Bagged Prepared	Bulk Prepared	Component Bulk
	- cents per dozen -			
Inuvik				
- barge	50	75.7	87	125
- truck		76.0	76	109
Cambridge Bay	135	103.0	118	170
Frobisher Bay	148	53.6	62	88
Rankin Inlet	148	95.9	110	152
Norman Wells	166	40.9	47	67

'These differentials factor in a comparison of the cost of bagged feed landed at various northern centres with the cost of feed in the forms indicated to producers at Edmonton. Dissimilar product is being compared. This proportionate difference in cost is applied against all production costs, and a differential derived. This differential serves here as a surrogate for data on higher operating costs in the Territories, and the costs of smaller scale operation. It is necessarily a gross estimate of real cost differentials.

Based on the comparison, particularly if one uses the differential versus component bulk feed in Edmonton, local production is advantageous in Frobisher Bay and Norman Wells, and given difficulties associated with reliability of supply, may also be viable in Rankin Inlet. This largest differential is the one likely to be operational. On this basis, local production supply becomes uneconomic in Inuvik and problematic in Cambridge Bay. Since there is little reported shipment to Cambridge Bay, pilot production in this centre might be worth the risk because this centre may be a captive market. However, such a development effort should be considered at a lower level of priority.

3.0 CONCLUSIONS REGARDING LOCAL EGG PRODUCTION AND MARKETING

Potential markets in Northern centres have been estimated by centre using the national averages per capita consumption of fresh eggs. It must be recognized that average Grade A Large egg prices in southern Canada would be substantially lower than those likely to be obtained in northern communities. Consequently, in spite of marketing reported by the trade for Inuvik, lower consumption levels should be postulated. it is proposed that a per capita figure at least one-third less (10 dozen) should be used for northern centres to take account of higher prices and differing lifestyles and income levels among the Territories' peoples. On this basis, the market projections shown in Table 7 would apply.

The data in Table 7 also derive potential flock sizes for small local production. These flocks are aimed at meeting consumption on an

average basis. When flocks are newly established, they would more than meet projected requirements. They would undersupply requirements as the flock approached the end of its normal production cycle.

Table 7

WEEKLY EGG REQUIREMENTS BY SELECTED NORTHERN CENTRES AND ASSOCIATED FLOCK EQUIVALENTS*

Centre	Egg Disappearance Per Week - dozen	Estimated Flock Equivalent (0.3846)
Norman Wells		
- Local	150 (10 boxes)	400
- Regional	300 (20 boxes)	800
Frobisher Bay		
- Local	570 (38 boxes)	1500
- Regional	1300 (85 boxes)	3400
Rankin Inlet		
- Local	250 (17 boxes)	650
- Regional	1135 (75 boxes)	2950
Cambridge Bay		
- Local	170 (11 boxes)	450
- Regional	390 (26 boxes)	1000

*Calculations are based on average production capacity of 0.3846 dozen/bird/week, and rounded to the nearest fifty birds. No allowance is made for mortality, or bird productivity, (which varies with production cycle, above average at inception, below average at end). The yield used is equivalent to production of 20 dozen (rather than 22 dozen) per year. This is a more conservative fiqure to take account of the beginning enterprises, and the difficult conditions.

To test the market while building expertise would suggest that test flocks at a minimum level of about 500 birds be considered as pilot projects. In three markets this could meet the greatest part of local needs.

Production at the 500 flock level would provide only marginal employment for one person to be carried out in spare time each day. Marketing about 200 dozen per week, the operator, (added to any labour and management return) might earn about $120 per week in Frobisher Bay, and about $200 per week in Norman Wells from extra profits above cost associated with transport differentials. This margin addition may not (or is not likely to) be present at Cambridge Bay or Rankin Inlet. Normal profits would run between 10 - 25$/dozen so these margins are important in retaining a production incentive. In these instances of small-scale production, these would be the most favorable areas for pilot projects. Frobisher Bay appears to have the largest potential market, locally and including secondary markets. It may be that encouraging a local retailer to undertake such a pilot project may be more likely to attract a positive reaction.

Actual implementation would require a more detailed feasibility study to verify that basic requirements like water, power, appropriate physical facilities and entrepreneurship are available at the site reviewed. Grants may be required to assist pilot projects to establish basic infrastructure - i.e. cages, physical facilities, etc. , and to persuade entrepreneurs to acquire the basic operating knowledge to make possible such operations. Such projects could be usefully linked with proposed efforts to produce vegetables with waste heat, both to economize on services and to provide an economic outlet for manure.

APPENDIX A

Egg Prices and Poultry Layer Feed Costs in the North*

1. Shell Egg Market Prices

Market prices for Grade A Large shell eggs in eight N.W.T. communities are presented in Table A-1. The prices reflect market conditions in mid-July, 1987. In most cases, wholesale prices were ascertained from Northern Poultry Limited, in Hay River. The wholesale prices reflect the cost of transportation to the communities in question.

Retail prices were assembled through telephone contact with grocery outlets in the various communities. The largest grocery vendor was contacted in each case. The prices requested were the "usual, or long term price" and not the temporarily discounted, or loss leader price that may prevail on an occasional basis.

2. Feed Costs

The estimated costs to supply and deliver egg layer feed to six N.W.T. communities are presented in Table A-2. The estimated costs reflect current prices for wheat, layer feed supplements, and transportation costs (truck, rail, barge).

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*Background data were collected and provided to Roygold Harketing Systems Ltd. by the Manecon Partnership in Edmonton, Alberta.

Table A-1

SHELL EGG MARKET PRICES - Grade A Large - July 1987

Centre	Wholesale - delivered -	Retail - in store -
Edmonton	$1.25	$1.45
Hay River	1.31	1.56
Yellowknife	1.36	1.55 to 1.60
Fort Simpson	1.36	1.60
Norman Wells	2.91	3.45
Cambridge Bay	2.60	2.92
Inuvik	1.75	2.09
Frobisher Bay	2.68	3.02

Table A-2

FEED COST SUMMARY

Centre	Prepared Feed bulk transport	Prepared Feed bagged transp.	Component Feeds bulk transp. grain
	- $ Per Tonne -		
Edmonton - truck	165.	190.	115.
Fort Simpson - truck - barge	249.	300.	185.
Norman Wells - barge	436.	405.	354.
Cambridge Bay - barge	790.	730.	711.
Inuvik - truck - barge	382. 512.	535. 499.	513. 433.
Rankin Inlet - rail/barge	729.	694.	754.
Frobisher Bay - barge	634.	471.	577.

A significant number of factors need to be considered in the preparation of feed costs. The approach taken to develop the feed costs presented in Table A-2 is outlined below:

- transportation routings to various communities were identified
- the load carrying capacities of transport equipment, loading and unloading facilities, were established

  feasible “packaging” approaches (containers, bulk bags, small bags, etc.) were established

  sources of supply for feed and feed supplements were found
- transport carriers were identified (e.g. bulk grain haulers, palletized load truckers, east coast barge companies)
- transportation cost estimates were assembled.

Two methods of creating the prepared feeds were considered:

- premixed, or prepared feed supplied from soutjern Canada
- the separate supply of grain, and feed supplements, with milling and mixing to occur on-site.

These packaging and mixing options were combined into three scenarios for cost analysis.

i) Prepared Feed - Bulk Transport

In this scenario, a mixed, ready to eat, full layer ration is prepared by a southern feed supply company. The product is transported in bulk from southern Canada to the egg layer site. At-site equipment and facilities required include bulk storage for 1000 - 1500 bushels, grain off-load augers, and large fork lift.

ii) Prepared Feed - Bagged Transport

In this scenario, a full layer ration is prepared by a southern company and packaged in 100 lb. paper bages, and palletized for shipment. The at-site facility and equipment requirements include storage space for bagged feed, a bag ripping hopper and auger system to move feed into the layer barn, and a fork lift.

iii) Component Feeds - Bulk Transported Grain

Grain is supplied from the closest production area and is delivered in bulk to the site. Feed supplements are purchased from southern feed companies, packaged in 100 lb. paper bags. The palletized bags are separately shipped to site. An on-site milling and mixing plant is required, in this scenario, to combine the component feeds into the layer ration. The at-site facilities required include a feed mixing mill and bulk storage for 1000 - 1500 bushels, container off load auger, and large fork lift.

Bulk transport of grain or prepared feed means:

- by truck, cartage in 1000 bushel bulk grain hauling transports
- by rail, cartage in grain carrying rail cars
- by barge, cartage in 20,000 lb. capacity closed steel shipping containers.

The bulk transfer of feed from truck to barge, or rail car to barge is required in some instances.

General Considerations

1. Livestock Feed Board of Canada, Feed Grain Subsidy

The feed costs presented incorporate the feed grain subsidy of $50 per tonne on the corn or wheat portion of the feed.

2. Layer Operation Size

A layer operation, consisting of 1000 birds, was considered as the basis for the cost estimate. Assuming a 1.9 kg. per dozen feed conversion ratio, and a 22 dozen per bird yield, the 1000 bird operation will require 41,800 kg. of prepared feed per laying cycle. This is equivalent to 1,537 bushels of prepared feed. For shipping cost estimation purposes, 20 tonne lots were usually considered as the shipping quantity.

3. Milling and Mixing Costs

For cost estimation purposes, a charge of $42 per tonne was applied to account for the costs of mixing component feeds into the finished feed ration, on site. This cost approximates the cost for mixing levied by established feed preparation companies in southern Canada. The applicability of this cost to a site-dedicated feed mill may be questioned.

Site Specific Considerations

1. Fort Simpson

Fort Simpson is served by all weather road from northern Alberta, or northern British Columbia. Prepared feed was assumed to be supplied by Champion Feeds Ltd., Westlock, Alberta (the current supplier for Frank Richardson - Hay River). In the case where feed ration is milled on site, the wheat is sourced from High Level/La Crete, Alberta.

2. Norman Wells/Cambridge Bay

These communities were considered to be supplied by barge, originating in Hay River. The grain, or prepared feed, was assumed to be supplied as for Fort Simpson. In each case, the feed is trucked to Hay River, transferred to an NTCL barge, and delivered to the dock in the community. A small allowance for transfer of the feed from the dock to the layer barn site was included.

3. Inuvik

Feed can be supplied to Inuvik by barge, or by truck via the Dempster Highway. The Barge transport option follows that described for Norman Wells. The truck transport option assumes that feed is supplied from central Alberta.

4. Rankin Inlet

Feed is supplied to Rankin Inlet by means of railroad from southern Manitoba to Churchill, Manitoba, and by barge from Churchill to Rankin Inlet. In all cases, the feed is supplied from southern Manitoba.

5. Frobisher Bay

Frobisher Bay is supplied by barge from Montreal. Prepared feed, or feed components were sourced in the Montreal area.