

LEGISLATIVE ASSEMBLY OF THE
NORTHWEST TERRITORIES
7TH COUNCIL, 46TH SESSION
RECOMMENDATION TO COUNCIL
NO. 3-46



RECOMMENDATION TO COUNCIL NO. 3-46

ESTABLISHMENT OF A COMMERCIAL
MUSK-OX FARM IN THE NORTHWEST TERRITORIES

DISPOSITION

Tabled	To Committee	Accepted as Read	Accepted as Amended	Deferred (to Session)	Rejected	Noted not Considered

Establishment of a Commercial Musk-Ox Farm
in the Northwest Territories

Background

At the 35th Session of the Northwest Territories Council it was proposed that a Committee of the Council be selected to undertake an investigation into the subject of musk-ox hunting.

As a result of the recommendations of that Committee limited quotas were established for the hunting of musk-oxen by the people of Grise Fiord. The Committee also recommended the initiation of a study of the economics of musk-ox farming.

An Information Paper has been submitted to Council Members reporting on a visit to the Musk-Ox Project at the University of Alaska in May 1971, by a party composed of Mr. John Parker, Deputy Commissioner, Mr. Lyle Trimble, Territorial Councillor, a representative of the Canadian Wildlife Service, and several members of the Department of Industry and Development.

Program

A detailed feasibility study has now been prepared¹ and the Department of Industry and Development has submitted a program for the establishment of a cottage knitting industry using wool produced by a domestic herd of musk-oxen. The program consists of:

- a) Establishing a farm of approximately 30 animals in the Fort Providence area during 1972;
- b) starting a pilot knitting project the following year in a selected settlement and gradually expanding the program as the supply of wool increases.

Farm costs (FY 1972/73) are estimated to be:

- | | |
|-------------------------------|-----------|
| a) Capital ² | \$ 75,000 |
| b) Operations and Maintenance | \$ 45,000 |

¹A copy of this report is attached

²Does not include the cost of employee housing

It has been estimated that the program will break even by 1977. The following is a summary of projected results:

	<u>Total for Period 1972/76</u>	<u>FY 1977/78</u>
Sales	\$ 336,700	\$ 173,900
Farm Operating & Maintenance		
Costs	215,675	49,300
Arts & Crafts Costs	32,000	8,000
Payment to Knitters	<u>227,500</u>	<u>107,500</u>
Net Profit (Loss)	<u>\$ (138,475)</u>	<u>\$ 9,100</u>

Recommendation

The Administration recommends that the program be implemented as outlined.

A STUDY OF THE FEASIBILITY
OF ESTABLISHING
A
COMMERCIAL MUSK-OX FARM
IN THE NORTHWEST TERRITORIES

Yellowknife, N.W.T.
August 1971

J.C. Birt
Industrial Development
Officer

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AIM

To assess the feasibility of establishing a cottage knitting industry in the Northwest Territories using wool produced by a domestic herd of musk-oxen.

BACKGROUND

There are many well known problems associated with cottage industries. Many families in the Northwest Territories however, earn a substantial portion of their income from such industries. Because of this, the Department of Industry and Development is active in encouraging cottage industries where they are economically viable.

The Department has found that only products with a distinctly "northern flavour" can find markets in southern Canada and abroad. Eskimo carvings are good examples of products with this "northern flavour".

There has been considerable interest for many years in using the wool of the musk-ox to develop another "northern" product. Research has been undertaken by the Institute of Northern Agricultural Research of Fairbanks, Alaska into the development of knitted articles made from the wool of domestic musk-oxen.

In May 1971, a group of Territorial Government officials visited INAR's facilities in Alaska to determine whether the Institute's research and experience could be used to develop this type of cottage industry in the Northwest Territories.

This report is a result of that visit.

THE MUSK-OX HERD

1. Basic Herd

The Institute of Northern Agricultural Research has suggested that 30 six month old musk-oxen be captured from the Thelon Game Sanctuary in October 1972. The Institute has offered to bear part of the cost of capturing and transporting the herd to a farm site in the Northwest Territories. Costs would range between \$700.00 to \$1,000.00 per animal, depending upon the location of the farm.

The herd initially would have 5 males and 25 females. The 2 best bulls would be selected for breeding, while the other 3 would be castrated to ensure easier handling.

2. Herd Growth

Growth of the basic herd would be slow initially, but by May 1980, the herd could reach a maximum of 220 animals.

The following chart illustrates the projected herd size and composition through 1980. The figures are based on there being no deaths other than the normal number of calves being stillborn (see p. A1). The actual results could be substantially less.

PROJECTED HERD STRUCTURE

	Calves	Yearlings	2 Year Olds	3 Year Old Cows	Mature Cows	Bulls	Steers	Total
Oct 72	30	-	-	-	-	-	-	30
May 73	-	30	-	-	-	-	-	30
May 74	-	-	30	-	-	-	-	30
May 75	16	-	-	25	-	2	3	46
May 76	25	16	-	-	25	2	3	71
May 77	25	25	16	-	25	2	3	96
May 78	30	25	25	8	25	4	9	126
May 79	41	30	25	12	33	4	22	167
May 80	53	41	30	12	45	5	34	220

THE FARM

1. General

The cost of establishing and operating a commercial musk-ox farm at Eskimo Point, the Belcher Islands, and Fort Providence has been estimated.

2. Capital Costs

Without firm quotations, it is difficult to estimate capital costs with any accuracy. The following is a rough estimate of the cost of the basic farm facilities in Fort Providence. Costs in the Keewatin will be considerably higher.

a) Combination Loafing shed/barn	\$15,000
b) Hay Shed	6,000
c) Garage/workshop - 3 bay	15,000
d) Truck - 3/4 ton	4,500
e) Tractor (with front end loader)	6,000
f) Hay Wagon	1,000
g) Water Facilities	2,000
h) Ski-doo's (2)	1,500
i) Tools	1,000
j) Fencing	12,000
k) Employee Housing	<u>25,000</u>
	<u>\$ 88,000</u>

3. Operating Costs

a) Personnel

The farm will require a manager plus two herdsmen.

	Eskimo Pt.	Belcher Islands	Ft. Providence
Salaries - manager	\$11,000	\$11,000	\$11,000
- herdsman	9,500	9,500	9,500
- herdsman	9,500	9,500	9,500
Allowances	1,400	1,400	---
Employers Share of Benefits	<u>825</u>	<u>825</u>	<u>825</u>
	\$32,225	\$32,225	\$30,825

b) Transportation and Communication

Travel costs will vary widely, but the equivalent of one trip to southern Canada, and one trip to Yellowknife would seem to be a minimum requirement.

	Eskimo Pt.	Belcher Islands	Ft. Providence
Duty Travel	\$1,200	\$7,500	\$500
Telephone	300	300	200
Freight, Postage	<u>500</u>	<u>500</u>	<u>300</u>
	\$2,000	\$8,300	\$1,000

c) Professional and Special Services

It has been the experience of the Fort Chimo musk-ox farm that a great deal of veterinary assistance is required initially. This service will be expensive, yet each visit will vary greatly in cost, depending on location.

	Eskimo Pt.	Belcher Islands	Ft. Providence
Daily Fee	\$100	\$100	\$100
No. of days/trip	6	6	4
Total Fees	600	600	400
Transportation Costs	170	3,150	150
Hotels, etc.	<u>100</u>	<u>100</u>	<u>100</u>
Total	\$870	\$3,850	\$650
Est. 5 trips/year	<u>\$4,350</u>	<u>\$19,250</u>	<u>\$3,250</u>

Five trips per year is probably too conservative. Fortunately the Canadian Wildlife Service has offered the services of its veterinarian in Fort Smith, and so the cost of these services are probably only realistic in the case of Fort Providence.

d) Office & Stationery Supplies

Costs are estimated at \$100 per year in each location.

e) Materials and Supplies

(a) Supplemental Feed

The herd as projected above (p. 2) will require supplemental feeding for an estimated 5 - 7 month period per year. The extent of supplemental feeding will of course, depend upon the capacity of the particular range that is being used. Without detailed range studies, scientifically valid estimates of supplemental feed requirements cannot be made, but by assumptions outlined in Appendix B, a rough forecast of such feeding costs has been made.

	Eskimo Pt.	Belcher Islands	Ft. Providence
Months/Year	7	7	5
Oct 72 - May 73	\$ 6,489	\$ 4,977	\$ 630
May 73 - May 74	7,784	5,971	755
May 74 - May 75	9,086	6,965	880
May 75 - May 76	13,412	10,285	1,300
May 76 - May 77	19,509	14,966	1,895
May 77 - May 78	26,691	20,475	2,590
May 78 - May 79	36,729	28,168	3,565
May 79 - May 80	50,225	38,521	4,875

(b) Gasoline, etc. \$1,000

(c) Veterinary Supplies \$1,000

f) Repair of Buildings and Equipment

Estimated at \$1,000 per year.

g) Miscellaneous

Estimated at \$1,000 per year.

WOOL PRODUCTION

It is estimated that the herd (p.2) will produce the following amounts of qiviut:

	Lbs. Per Animal	May 73	May 74	May 75	May 76	May 77	May 78	May 79	May 80
Yearlings	3	90	-	-	48	75	75	90	123
2 Year Olds	3	-	90	-	-	48	75	75	90
3 Year Old Cows	4	-	-	100	-	-	32	48	48
Mature Cows	4	-	-	-	100	100	100	132	225
Bulls	7	-	-	14	14	14	28	28	35
Steers	7	-	-	21	21	21	63	154	238
Total Raw	-	90	90	135	183	258	373	527	759
Total Refined*	-	80	80	125	170	235	335	475	675
Cost/lb-Eskimo Pt.		614	649	437	357	291	230	188	154
Cost/lb-Belcher Is.		860	891	597	467	362	276	214	168
Cost/lb - Ft. Providence		499	521	347	265	199	147	109	81

* a 10% loss during processing is expected.

KNITTING

Knitting Program

Because there is almost no cost in shipping spun qiviut, knitting can be done anywhere in the N.W.T. Knitting should probably be done in the poorer settlements such as Eskimo Point or Whale Cove. The program could be extended in later years.

An Arts and Crafts officer with experience in knitting would be required on a part time basis. The cost of the officer to this program is estimated at \$8,000 per year.

The knitting program need not start until 1974, or until an adequate supply of qiviut has been built up. A program of gathering qiviut from the wild could also be started to augment the farm's production.

Experiments should also be conducted to develop new products.

Products

A wide range of knitted products can be made by Eskimo and Indian women. The main products in Alaska are scarves and head wear. Large lacy patterns are used to minimize the amount of yarn that is used, and to maximize the labour input.

INAR has developed the concept of the scarf unit to calculate the payment to knitters. A woman is paid \$25 for knitting a scarf unit, which is the equivalent of being paid the minimum wage.

One pound of qiviut will yield about 20 scarf units.

Marketing

There has been no research done on the marketing of qiviut products, and all calculations are based on figures supplied by INAR.

One scarf unit is sold for \$37.00 by INAR (wholesale).

Additional Sources of Income

If the farm is located along the Mackenzie Highway, some revenue could be expected from tourists. It may be necessary to hire a guide during the summer months. This would increase costs, but net income could be expected. Such a location would be an important tourist attraction, and would give excellent publicity to qiviut products.

The sale of surplus animals as zoo specimens is another potential source of revenue. No cows should be sold for at least eight years, or until herd size becomes a problem.

SUMMARY OF PROJECTED RESULTS

	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Processed Wood Production	-	50	80	125	170	235	335	475
or No. of Scarf Units	-	1,000	1,000	2,500	3,400	4,700	6,700	9,500
<u>ESSEX POINT</u>								
Sales - 55¢ Scarf Unit	-	59,200	59,200	92,500	125,800	173,900	247,900	351,500
Earn Out M Costs	49,175	51,950	54,650	60,750	68,400	77,350	89,150	104,550
Arts & Crafts costs	-	8,000	8,000	8,000	8,000	8,000	8,000	8,000
Payment to Knitters	-	<u>10,000</u>	<u>10,000</u>	<u>62,500</u>	<u>85,000</u>	<u>107,500</u>	<u>167,500</u>	<u>237,500</u>
Net Profit (Loss)	(\$49,175)	(\$40,750)	(\$43,450)	(\$38,750)	(\$35,600)	(\$18,950)	(\$16,750)	\$ 1,450
<u>BELCHER ISLANDS</u>								
Sales	-	59,200	59,200	92,500	125,800	173,900	247,900	351,500
Earn Out M Costs	68,875	71,350	73,850	78,750	85,100	92,350	101,850	114,050
Arts & Crafts costs	-	8,000	8,000	8,000	8,000	8,000	8,000	8,000
Payment to Knitters	-	<u>10,000</u>	<u>10,000</u>	<u>62,500</u>	<u>85,000</u>	<u>107,500</u>	<u>167,500</u>	<u>237,500</u>
Net Profit (Loss)	(\$68,875)	(\$60,150)	(\$62,650)	(\$56,750)	(\$52,300)	(\$33,950)	(\$29,450)	(\$ 8,050)
<u>FORT PROVIDENCE</u>								
Sales	-	59,200	59,200	92,500	125,800	173,900	247,900	351,500
Earn Out M Costs	39,775	41,250	42,900	44,800	46,950	49,300	52,050	55,150
Arts & Crafts costs	-	8,000	8,000	8,000	8,000	8,000	8,000	8,000
Payment to Knitters	-	<u>10,000</u>	<u>10,000</u>	<u>62,500</u>	<u>85,000</u>	<u>107,500</u>	<u>167,500</u>	<u>237,500</u>
Net Profit (Loss)	(\$39,775)	(\$30,050)	(\$31,700)	(\$22,800)	(\$14,150)	\$ 9,100	\$20,350	\$50,850

RECOMMENDATIONS

1. The Government should be aware that this proposal has some very high risks. The greatest risks are:

a) that there will be more deaths in the herd than has been indicated in the study, and

b) that there will be no market for the goods that are produced by the knitters.

2. These risks appear to be balanced to some extent by:

a) the potential for generating wages (from knitting) in the poorer settlements, and

b) the need for government leadership in agricultural and industrial development in the north.

3. The Government of the Northwest Territories should therefore, probably proceed with the establishment of a musk-ox farm in the Fort Providence - Fort Simpson area.

4. The farm should not be located in the Keewatin because of the high capital and operating costs, nor should it be located in the Fort Smith area because of the danger of anthrax.

APPENDIX A

Breeding

a) In the wild, the rut occurs between mid July and late September. Breeding in captivity should take place only in September, however, in order to control the time when calving occurs.

b) During the rut, the bulls should be kept apart. They can then be introduced to harems of approximately 12 cows during September. Fairly sophisticated fencing may be required when several harems are involved.

c) Cows reach breeding maturity at 2 1/2 years, and will bear their first calves at 3 years of age. First calving heifers that are bred should weigh at least 250 lbs to minimize potential problems during calving.

d) Artificial insemination may be possible only if a method is found for determining when cows are in heat.

e) Breeding experiments at the Alaska farm have concentrated on improving qiviut productions and reducing the size of the animal. Smaller sized animals require considerably less food than larger animals, but produce only slightly less qiviut (Bergman's rule). Such a program may result in reduced hardiness however.

f) Four distinct gene pools (Thelon, Banks Island, Ellesmere Island, and Greenland) may offer possibilities for later experiments.

Calving

a) Because of controlled breeding, calving at the Alaskan farm occurs mainly between May 8 and 18.

b) Birth usually takes place in the open and lasts only a few minutes.

c) Approximately 1/3 of first calving heifers lose their calves (as is the case with dairy cattle). Still-births are rare in more mature animals.

d) The mean weight of calves at birth in Alaska is 22 lbs.

Feeding

a) At all farms, musk-oxen graze on pasture in summer and are fed hay during winter.

b) In winter the animals are fed straight brome grass at the Alaskan farm, while a combination of brome and Timothy is used in Vermont. The daily feed disappearance rate in Alaska is as follows:

Calves	5-6 lbs of hay
Yearlings	6 lbs of hay
Cows	7 lbs of hay
Bulls	10-12 lbs of hay
Steers	10-12 lbs of hay

c) Musk-oxen do not seem to be able to handle grain well, although it may be possible to use it in small quantities.

d) The amount of supplemental feed required will naturally depend on the productivity of the farm area.

Qiviut Production

a) Musk-oxen shed their hair in the spring, usually in late May (depending on the weather).

b) The hair is removed over a 3 or 4 day period by plucking, rather than by shearing.

c) Raw qiviut is produced in the following quantities.

Yealings	3 lbs/year
Cows	4 lbs/year
Bulls	7 lbs/year
Steers	7 lbs/year

d) There is an approximate 10% loss in weight during the refining process, although many people prefer articles made of the raw hair.

e) Qiviut is currently sold for:

Raw	\$35/lb
Refined	\$50/lb

These prices may be forced down as production increases, and are considerably below current costs estimates.

f) Four grades of qiviut, coming from different parts of the body, have been identified.

Animal Handling and Care

- confidence of handler is most important.
- herd management is easier if bulls are kept separate because the bulls tend to wander.
- young animals can be trained to halter.
- a new calf that is being carried must be set down periodically if the cow is to follow. She apparently cannot actually see it being carried.
- handling is generally easier than domestic cattle.
- hooves do not need to be trimmed as the ends grow out and drop off.
- dehorning is done in November of the first year. The method is tricky, but the vet in Alaska takes only 7 minutes per calf.
- M99 is used for dehorning as tranquilizers are not completely safe.

- some boss development appears desirable for skull protection. Cutting the ends of the horns off is not satisfactory however, because twigs, etc. can get caught between the horn and skull and can cause infection.
- one aggressive bull was castrated at 3 years. He is quite docile now, and has blacker hair. (his head also appears to be smaller).

Parasites and Diseases

- treatment for parasites has not been necessary at Fairbanks. There was monthly treatment in Vermont probably due to warmer weather.
- warbles were found in the group from Nunivak Island that were held in a building that had been used to store reindeer hides. They were treated with "corral".
- facial abscesses present occasionally (carina) - foxtail.
- the animals are weighed daily as part of research program in Alaska. Drastic weight changes (and gum colour) are good indicators of illness.

APPENDIX B

Calculation of Supplemental Feed Costs

1. Musk-oxen at the Fairbanks farm were fed biome grass during the winter months. The herd as projected above (p.) will require the following amounts of Hay (or its equivalent) each month.

	<u>HAY REQUIREMENTS</u>								
	<u>Calves</u>	<u>Year- lings</u>	<u>2 Year olds</u>	<u>3 Year old Cows</u>	<u>Mature Cows</u>	<u>Bulls</u>	<u>Steers</u>	<u>Lbs Per Day</u>	<u>Tons Per Month</u>
IRS/Animal/Day*	5	6	7	7	7	11	11	-	-
Oct 72 - May 73	150	-	-	-	-	-	-	150	2.25
May 73 - May 74	-	180	-	-	-	-	-	180	2.70
May 74 - May 75	-	-	210	-	-	-	-	210	3.15
May 75 - May 76	80	-	-	175	-	22	33	310	4.65
May 76 - May 77	125	96	-	-	175	22	33	451	6.765
May 77 - May 78	125	150	112	-	175	22	33	617	9.255
May 78 - May 79	150	150	175	56	175	44	99	849	12.735
May 79 - May 80	205	180	175	84	231	44	242	1,161	17.415

* Rate of feed disappearance in Alaska

As the herd grows, an increasing amount of supplemental feed will be required because of the limited area that can be practically used for pasture.

2. The cost of importing hay to the three locations has been estimated to be:

HAY COSTS

1. Eskimo Point

Hay - FOB Hudson Bay Junction Sask. (1)	\$20/ton
Rail (2)	26
Loading charges	15
Water (3)	<u>351</u>
Total	\$412/ton

2. Belcher Islands

Hay - FOB Cochrane Ont. (1)	\$ 20/ton
Rail (4)	43
Loading charges	15
Water (5)	<u>238</u>
Total	\$316/ton

3. Fort Providence

Hay - FOB Hi Level Alta (1)	\$ 20/ton
Truck	30
Loading charges	<u>6</u>
Total	\$ 56/ton

- (1) based on 50 pound bales 1.5' x 1.5' x 3' - 6.75 cu. ft. or 270 cu. ft/ton.
- (2) based on car load rates Hudson Bay Junction to Churchill \$400/car (20 tons or 4,200 cu. ft.) car 12' x 10' x 35' - 4,200 cu. ft.
- (3) Churchill - Eskimo Point \$78/60 cu. ft.
- (4) based on car load rate Cochrane to Moosonee \$668/car
- (5) Moosonee to Belcher Islands \$53/60 cu. ft.

3. Using the preceeding estimates, it is possible to forecast the monthly cost of supplemental feed in each location.

MONTHLY FEEDING COSTS

	Tons/Month	Eskimo Pt.	Belcher Islands	Ft. Providence
Oct 72 - May 73	2.25	\$ 927	\$ 711	\$126
May 73 - May 74	2.70	1,112	853	151
May 74 - May 75	3.15	1,298	995	176
May 75 - May 76	4.65	1,916	1,469	260
May 76 - May 77	6.765	2,787	2,138	379
May 77 - May 78	9.255	3,813	2,925	518
May 78 - May 79	12.735	5,247	4,024	713
May 79 - May 80	17.415	7,175	5,503	975

4. It is estimated that the herd would have to be fed for 7 months per year at Eskimo Pt. and the Belcher Islands, and for only 5 months at Ft. Providence.

Hay could probably be cut in the Ft. Providence area at a considerably lower cost.