EFFECTS OF IMPROVED NUTRITION IN PREGNANT REINDEER ON MILK QUALITY, CALF BIRTH WEIGHT, GROWTH, AND MORTALITY

Virkningen av bedret ernæring til drektige reinsimler på melkekvalitet, kalvenes fødselsvekt, vekst og dødelighet.

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Abstract: A group of 35 pregnant reindeer *(Rangifer tarandus)* was divided into two groups in mid-February. Until calving in May one of the groups (L) received lichen *ad lib.*, while the other group (IN) received an improved diet, rich in protein and minerals. After calving both groups received the same improved diet. In both groups it was distinguished between young (<3 years) and old (>3 years) animals. At the start of the experiment the body weight of L-young animals was 58.5 ± 4.6 kg, IN-young 56.2 ± 2.8 kg, L-old 70.3 ± 6.0 kg and IN-old 68.2 ± 4.8 kg. At calving the weights of the same animals were 55.9 ± 4.5 kg (L-young), 68.1 ± 2.5 (IN-young), 70.0 ± 6.9 kg (L-old) and 81.6 ± 6.8 kg (IN-old). Birth weight of IN-young calves was 4.5 ± 0.7 kg and of L-young calves 3.7 ± 0.5 kg. Birth weight of IN-old calves was 5.7 ± 0.8 kg and of L-old calves 4.4 ± 0.6 kg. The birth weight of the calves in all groups was correlated to the weight of the female just prior to calving. Growth rates in all but the IN-old group were not different, the IN-old group showing a significantly higher growth rate than the other groups. In mid-September, however, the average body weight for the calves from the L and IN-groups did not differ significantly. Neither chemical composition nor total energy content of the milk differed significantly between the groups. Total mortality in the L-group was 28% as compared to 7% in the IN-group. Two females in the IN-old group had not given birth at the end of the experimental period.

Key words: Reindeer, *Rangifer tarandus*, nutrition, growth, milk composition.

***Rangifer** 3 (2):10—18*

ROGNMO, A., MARKUSSEN, K.A., JACOBSEN, E., GRAV, H.J., BLIX, A.S. 1983. Virkningen av bedret ernæring til drektige reinsimler på melkekvalitet, kalvenes fødselsvekt, vekst og dødelighet.

Sammendrag: En flokk på 35 drektige reinsimler *(Rangifer tarandus)* ble delt i to grupper i midten av februar. Frem til kalving i mai ble den ene gruppen gitt lav *ad lib.* (L-gruppe), mens den andre gruppen ble tilleggsfôret med 2 kg RF - 71/dag (IN-gruppe). Etter kalving ble begge gruppene gitt 2 kg RF - 71/dag. Innen begge gruppene ble det skilt mellom unge (<3 år) og gamle (>3 år) simler. Ved forsøkets start var kroppsvekten for unge simler ca. 57 kg, og for gamle simler ca. 69 kg, i begge ernæringsgruppene. Ved kalving var kroppsvekten for unge simler 55.9 ± 4.5 kg (L-gruppe), og 68.1 ± 2.5 kg (IN-gruppe) mens kroppsvekten for gamle simler var 70.0 ± 6.9 kg (L-gruppe) og 81.6 ± 6.8 kg (IN-gruppe). Fødselsvekt for kalver etter IN-unge simler var 4.5 ± 0.7 kg, og 3.7 ± 0.5 kg for kalver etter L-unge simler. De tilsvarende fødselsvektene for kalver etter gamle simler var 5.7 ± 0.8 kg (IN-gruppe) og 4.4 ± 0.6 kg (L-gruppe). Fødselsvektene var korrelert til simlenes kroppsvekt like før kalving. Kalveveksten i de første tre ukene etter fødselen var signifikant høyere for kalver etter IN-gamle simler, sammenlignet med kalveveksten i de øvrige tre gruppene, som ikke var innbyrdes signifikant forskjellige. I midten av september var det ingen signifikante forskjeller i kalvenes kroppsvekt gruppene imellom. Det var ingen signifikante forskjeller hverken i totalt

energiinnhold eller i kjemisk sammensetning av melken fra simlene i de to ernæringsgruppene. Total dødelighet for kalver i L-gruppen var 28% mot 7% i IN-gruppen i løpet av de tre første ukene etter fødselen. To av de gamle simlene i IN-gruppen hadde ikke kalvet ved forsøkets slutt.

Nøkkelord: Reinsdyr, *Rangifer tarandus*, ernæring, vekst, melkesammensetning.

***Rangifer** 3 (2):10—18*

ROGNMO, A., MARKUSSEN, K.A., JACOBSEN, E., GRAV, H.J., BLIX, A.S. 1983. Kantavien porovaatimien parannetun ravinnon vaikutus maidonlaatuun, vasojen syntymäpainoon, kasvuun ja kuolleisuuteen.

Yhteenveto: 35 kantavan porovaatimen (*Rangifer tarandus*) lauma jaettiin kahteen ryhmään helmikuun puolivälissä. Vasomiseen saakka toukokuussa annettiin toiselle ryhmälle jäkälää *ad. lib.* (L-ryhmä), kun taas toinen ryhmä sai lisäravintona 2 kg RF-71 rehua päivässä (IN-ryhmä). Vasomisen jälkeen annettiin molemmille ryhmille 2 kg RF-71 rehua päivässä. Molemmissa ryhmissä erotettiin nuoret (< 3-vuotiaat) ja vanhat (> 3-vuotiaat) vaatimet toisistaan. Tutkimuksen alkuvaiheessa oli nuorten vaatimien ruumiinpaino n.57 kg, ja vanhojen vaatimien n.69 kg, molemmissa ravintoryhmissä. Vasomisen aikana oli nuorten vaatimien ruumiinpaino 55,9 ± 4,5 kg (L-ryhmä), ja 68,1 ± 2,5 kg (IN-ryhmä), kun taas vanhojen vaatimien ruumiinpaino oli 70,0 ± 6,9 kg (L-ryhmä) ja 81,6 ± 6,8 kg (IN-ryhmä). Vasojen syntymäpaino IN-nuorten vaatimien ryhmässä oli 4,5 ± 0,7 kg, ja 3,7 ± 0,5 kg L-nuorten vaatimien ryhmässä. Vastaavat syntymäpainot vanhojen vaatimien vasoilla olivat 5,7 ± 0,8 kg (IN-ryhmä) ja 4,4 ± 0,6 kg (L-ryhmä). Syntymäpainot
olivat vastaavuussuhteessa vaatimien ruumiinpainoon vähää ennen vasomista. IN-vanhojen vaatimien vasojen kasvu ensimmäisten kolmen viikon aikana syntymän jälkeen oli merkittävästi korkeampi, verrattuna niiden kolmen muun ryhmän vasankasvuun, jotka eivät olleet keskenään merkittävän erilaisia. Vasojen ruumiinpainossa ryhmien kesken ei ollut mitään merkittäviä eroavaisuuksia syyskuun puolivälissä. Näiden kahden ravintoryhmän vaatimien maidossa ei ollut mitään merkittäviä eroja kokonaisuudessa ravinnon sisältöön eikä kemialliseen kokoonpanoon nähden. Vasojen kokonaiskuolleisuus L-ryhmässä oli 28% ja IN-ryhmässä 7% kolmena ensimmäisenä viikkona syntymän jälkeen. Kaksi vanhaa vaadinta IN-ryhmässä ei ollut vasonut tutkimuksen lopussa.

Avainsanoja: poro, *Rangifer tarandus*, ravinto, kasvu, maidonkokoomus.

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INTRODUCTION

The pregnancy rate of Norwegian reindeer and caribou is known to be very high, more than 90% in animals older than 3 years (Lenvik et al. 1982, Parker 1981). The mortality rate during the first few days of life is, however, assumed to be as high as 5 to 20% (Pruitt 1961, Skjenneberg and Slagsvold 1968, Nieminen et al. 1982), and after four months losses may exceed 50% in certain areas (Rehbinder 1975).

Maternal nutrition during pregnancy is assumed to be of importance for calf birth weight, growth and survival (Skjenneberg and Slagsvold 1968, Bergerud 1975, Espmark 1980).

The normal winter and spring (pregnancy) diet of reindeer and caribou is lichen, which is high in energy content, but very low in protein and minerals (Steen 1968, Skjenneberg and Slagsvold 1968, Holleman and Luick 1977).

To test the effect of maternal nutrition during pregnancy on milk quality and calf birth weight, growth and survival in Norwegian reindeer we offered two groups of animals diets of very different quality from mid-February until calving in May.

METHODS

Animals

On 17 February, 35 pregnant Norwegian reindeer (*Rangifer tarandus tarandus*) were transferred from a local herd to the Norwegian State Reindeer Research Station at Lødingen (69°N) on the Norwegian coast. Immediately upon arrival the animals were separated into two groups, consisting of 17 and 18 animals, respectively. The age composition in the two groups was similar, but in presenting our results we have distinguished between young animals (age 2-3 years) and old ones (older than 3 years). Each of the two groups was kept in different 5000 m^2 pens adjacent to each other. From these pens the animals were easily transferred to a small corral where the animals could be captured whenever sampling or weighing was to be done. The animals were kept in the pens

Table 1. Food intake, energy content and composition of feed for animals of the Improved Nutrition (IN) group and the Lichen (L) group during the gestation period.*

*Tabell 1. Føropptak, energi-innhold og sammensetning av fôr i tilleggsfôr (IN) og lavfôr (L) gruppen under drektighetsperioden.**

Group *Gruppe*	Dry matter intake (gram/day · animal) *Tørrstoff opptak (gram/dag · dyr)*	Metabolizable energy intake (Kcal/day · animal) *Fordøyelig energi opptak (Kcal/dag · dyr)*	Crude protein intake (gram/day · animal) *Råprotein opptak (gram/dag · dyr)*	Ether extract intake (gram/day · animal) *Eter ekstrakt opptak (gram/dag · dyr)*	N-free extract intake (gram/day · animal) *N-fritt ekstrakt opptak (gram/dag · dyr)*
IN	1880	3080	260	135	1175
L	1490	2240	64	35	914

* Based on data from Jacobsen and Skjenneberg (1976) and Jacobsen and Skjenneberg (1979).

* *Fremkommet på grunnlag av data fra Jacobsen og Skjenneberg (1976) og Jacobsen og Skjenneberg (1979).*

from the start of the experiment (17 February) until 21 June when both groups of animals together with their calves were let out on the natural nearby range. At the end of the first experimental period (June) two of the old IN-group females had not given birth, and were consequently excluded.

Nutrition

The animals in one of the groups, hereafter called Improved Nutrition (IN) group were offered 2.0 kg of a pelleted concentrate/animal · day, which is supposed to reflect an optimal winter nutritional condition, throughout the experimental period (February-June). The energy content and chemical composition of this diet are given in Tables 1 and 2.

The animals in the second group, hereafter called the Lichen (L) group, were offered lichen (mostly Cladonia sp.) *ad lib.* during the gestation period (February-May). Since the winter conditions of the range from which the animals were captured were extremely severe, with heavy snow prior to capturing, also the animals of this group required a supplement of 0.2 kg concentrate/animal · day to avoid a devastating mortality during the experimental period (Tables 1 and 2). Nevertheless, we assume that this diet reflects severe nutritional winter conditions. The energy content and chemical composition of this diet are given in Tables 1 and 2. During the first three weeks of lactation the animals of both groups were offered the improved (2.0 kg concentrate/animal · day) diet.

Sampling and weighing procedures

The body weights of the pregnant animals were obtained at intervals from the start of experiments (February) till calving (May) to the nearest 0.1 kg, by use of an electronic Sauter Kom-system, AZ/N2E scale. All weighings were done in the morning at 0800 h, before feed was provided. The birth weights of the calves were obtained 5 hours after parturition by use of a calibrated steel yard (accuracy 0.02 kg). The calves were thereafter weighed every day for the first 5 days and then every third day until three weeks *post partum.* The calves were weighed during the marking round-up (31 July) and during the slaughtering round-up (16 September). During both these round-ups a number of calves, born and raised on the nearby natural range, were also weighed. Mortality among the calves during the three first weeks *post partum* period was recorded.

Table 2. Chemical composition of the diets. Components in percent of dry matter.*

*Tabell 2. Fôrets kjemiske sammensetning uttrykt i prosent av tørrstoff.**

Diet *Fôr*	Organic matter *Organisk materiale*	Ash *Aske*	Crude protein *Råprotein*	Ether extract *Eter-ekstrakt*	Crude fiber *Råfiber*	N-free extract *N-fritt ekstrakt*
Concentrate (RF-71) *Kraftfôr (RF-71)*	94.4	5.6	13.7	7.2	11.0	62.5
Lichen *Lav*	98.6	1.4	3.1	1.7	32.6	61.5

* Based on information from Jacobsen and Skjenneberg (1976) and Jacobsen and Skjenneberg (1979).

* *Fremkommet på grunnlag av data fra Jacobsen og Skjenneberg (1976) og Jacobsen og Skjenneberg (1979).*

Milk sampling and analysis

Milk samples (20 ml) were taken at intervals during the first three weeks *post partum* as well as during the marking (July) and slaughtering (September) round-ups. When animals failed to respond to milking, oxytocin (10 IU) was administered (i.m.). The milk samples were frozen immediately and stored at - 20°C until analysed.

The analyses of the major constituents of the milk were carried out by use of standard dairy methods (International Dairy Federation). Fat was analysed according to Røse-Gottlieb, Nitrogen using a micro-Kjeldal method and lactose as the difference between total dry matter and the other constituents. Total energy content of milk was determined, in triplicate, by use of direct bomb calorimetry (Gallenkamp).

Statistics

Differences in body weight of calves and of adult animals together with differences in milk composition between animals from IN- and L-groups were evaluated by unpaired t-tests.

RESULTS

At the start of experiments there was no significant difference between the two nutritional groups, body weights being 56.2 ± 2.8 kg (n = 7) and 58.5 ± 4.7 kg (n = 7) for the young animals of the IN and L-groups, respectively, and for the old animals 68.2 ± 4.1 kg (n = 10) and 70.3 ± 5.4 kg (n = 11) for the IN and L-groups, respectively (Fig. 1). For both young and old animals of the L-group, body weight was maintained throughout the gestation period, being 55.9 ± 4.5 kg (n = 7) for young animals and 68.1 ± 2.5 kg (n = 11) for old animals at the time of calving. The body weight of both young and old animals of the IN-group, on the other hand, increased significantly ($P < 0.001$) to 68.1 ± 2.5 kg (n = 7) and 81.6 ± 6.9 kg (n = 10) for young and old animals, respectively.

The birth weights of the calves after young animals in the IN-group were significantly ($P < 0.05$) greater than those from the L-group, being 4.51 ± 0.71 kg (n = 7) and 3.71 ± 0.50 kg (n = 7), respectively (Fig. 2). It is worth noticing, however, that the smallest of the L-young calves died very soon after birth (Fig. 5), and that the difference in body weight between the two groups no longer existed after day 1. The rate of body weight increase during the first three weeks *post partum* was not significantly different, being 0.30 kg/day in both groups of calves.

Birth weights of the calves born to old females in the IN-groups were significantly ($P < 0.002$) greater than for the calves of the L-group, being 5.75 ± 0.78 kg (n = 8) and 4.45 ± 0.56 kg (n = 11), respectively (Fig. 3). The rate of body weight increase was, however, significantly ($P < 0.02$) greater for calves of the IN-group as compared to the calves of the L-group, the rate of increase being 0.35 kg/day and 0.29 kg/day for the IN and L-groups, respectively.

In July average body weight of calves after L-group animals was 25.7 ± 2.8 kg (n = 12) which was

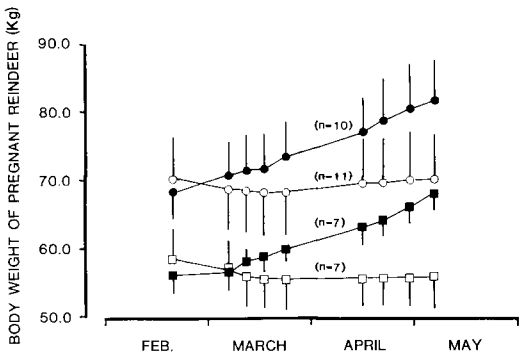

Fig. 1. Body weights (mean ± standard deviation) of pregnant reindeer from February till calving in May. Old animals (older than 3 years) and young animals (2-3 years of age) are represented by circles and squares, respectively, Improved Nutrition animals, filled symbols, and Lichen fed animals, open symbols.

Fig. 1. Kroppsvekter (middelverdi ± standardavvik) av drektige reinsimler fra februar til kalving i mai. Gamle simler (eldre enn 3 år) og unge simler (2-3 år) er angitt henholdsvis med sirkler og firkanter. Tilleggsfôrete dyr er representert med fylte symboler, mens lavfôrete dyr er representert med åpne symboler.

significantly ($P < 0.05$) less than the body weight of the IN-group calves, being 29.1 ± 4.3 kg (n = 12) at the same time (Fig. 4). The average weight of «wild» calves at the same time was 29.8 ± 4.3 kg (n = 32), which is significantly ($P < 0.001$) greater than the weight of L-group calves, but similar to the weight of IN-groups calves. In mid-September there was no longer any significant differences in body weight between any of the three groups, average body weight of L, IN-group and «wild» calves being 40.9 ± 2.9 kg (n = 12), 43.0 ± 4.6 kg (n = 9) and 42.9 ± 4.9 kg (n = 38), respectively.

Of all calves born (n = 18) in the L-group 5 died, all within 2 days of birth. In the IN-group one calf was stillborn, while all the rest were born alive and survived, at least until released at the age of three weeks (Fig. 5). Thus, the early mortality rate in the L-group was 28%, as compared to 7% (one animal) in the IN-group.

A highly significant ($P < 0.01$) linear regression was obtained between birth weight of calves and the weight of the pregnant female just prior to calving (Fig. 5).

At no time during the lactation cycle was there any difference in the composition of the milk from animals of the IN- and L-groups (Table 3). Neither was there a significant difference in energy content of milk from the two groups. Thus, the data from both groups were pooled. A highly significant ($P < 0.01$), $r = 0.82$, relationship between energy content of the milk and sampling date was then obtained (Fig. 6).

DISCUSSION

This study has shown that supplementary feeding in addition to the normal winter (lichen) diet increases female body weight during pregnancy. This increase is probably due to a much higher intake of dietary crude protein and fat in the IN-group (Table 1). Birth weight of calves was found to correlate with the weight of the female just prior to calving. This is in good agreement with several reports on sheep (Thomsen and Thomsen 1949, Peart 1967) and reindeer (Espmark 1980), showing that birth weight of the offspring is positively correlated to maternal food intake during pregnancy. Likewise, Bergerud (1975) has presented indirect evidence to this effect showing

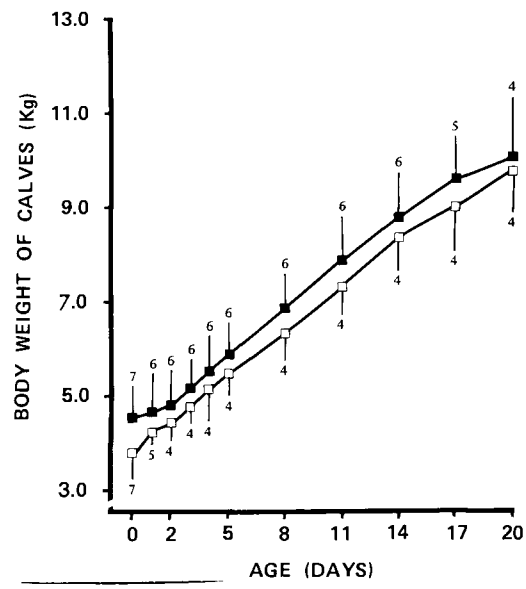

Fig. 2. Body weights (mean ± standard deviation) of calves after young (2-3 year old) animals from the Improved Nutrition (■) and the Lichen fed (□) groups during the first three weeks *post partum*.

Fig. 2. Kroppsvekter (middelverdi ± standardavvik) av kalver etter unge (2-3 år) tilleggsfôret (■) og lavfôret (□) simler de første tre ukene etter fødselen.

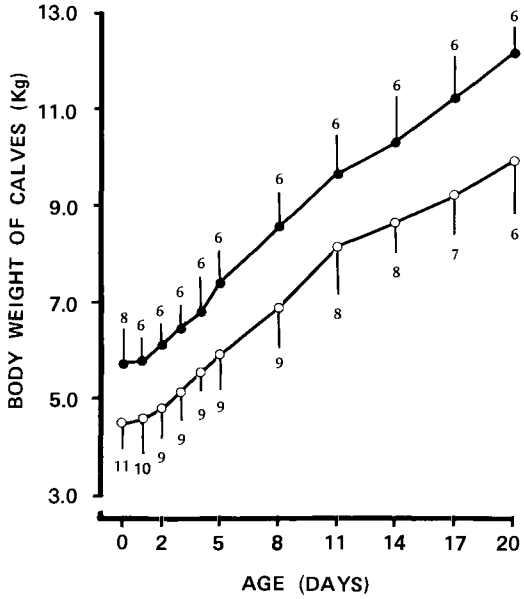

Fig. 3. Body weights (mean ± standard deviation) of calves after old (older than 3 years) animals from the Improved Nutrition (●) and the Lichen fed (○) groups during the first three weeks *post partum*.

Fig. 3. Kroppsvekter (middelverdi ± standardavvik) av kalver etter gamle (eldre enn 3 år) tilleggsfôrete (●) og lavfôrete (○) simler de tre første ukene etter fødselen.

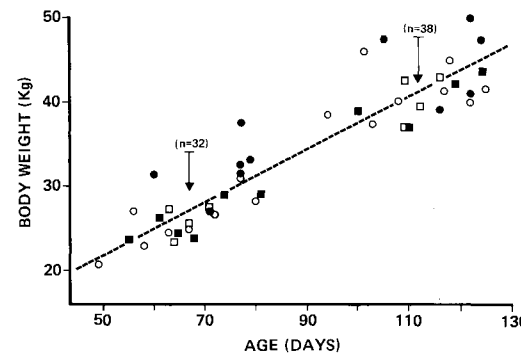

Fig. 4. Body weights of calves previously included in the Improved Nutrition and the Lichen fed groups presented in Figs. 2 and 3, obtained during the calf marking round-up on July 31, and during the autumn slaughtering round-up on September 16. Symbols as for Figs. 2 and 3. The (dotted) line was obtained by linear regression analysis and is described by the following equation:
$Y = 0.31X + 6.68$,
where Y is calf body weight in kg, and X is known age in days.
Included in the graph, but not in the regression analysis, are mean weights with standard deviation of «wild» calves (▼). The age of these calves is based on average calving time obtained from local reindeer herders.

Fig. 4. Kroppsvekt av tilleggsfôrete og lavfôrete kalver tidligere presentert i figurene 2 og 3, registrert under kalvemerkingen, 31. juli, og under høstslaktingen, 16. september, angitt med de samme symbolene som i figurene 2 og 3. Den stiplede linjen er fremkommet ved lineær regresjonsanalyse og kan beskrives med følgende formel:
Y= 0.31X + 6.68, hvor Y er kroppsvekt i kg og X er kjent alder i dager.
Inkludert i figuren, men ikke i regresjonsanalysen, er midlere kroppsvekt i kg, med standard avvik, av «ville» kalver (▼). Alderen til disse kalvene er beregnet ut fra midlere kalvingstidspunkt oppgitt av lokale reindriftsutøvere.

that there is a negative correlation between snow depth in winter and birth weight of caribou calves. The composition of the milk (Table 3) obtained from animals in our IN- and L-groups was not significantly different at any time of the lactation period. This is in full agreement with Ling et al. (1961) stating that «in most animals not specialized for milk production the composition of the milk is, apart from the vitamins, largely independent of the quality of the diet.»

The compositional changes of the milk which occurred during the lactation period in the present study (Table 3) are in agreement with the values reported earlier for caribou (Luick et al. 1974) and reindeer (Luthala et al. 1968).

Given a similar total energy content and composition of the milk both in IN- and L-females our data indicate that milk yield, as reflected in the growth rate of the calf, within certain limits, is independent of female nutrition during pregnancy, at least when the female is offered a high quality diet after calving. Thus, the L-young, L-old and IN-young calves exhibited an identical growth rate, while the IN-old calves gained weight at a significantly ($P < 0.02$) higher rate. Likewise, three weeks *post partum*, the calves after IN-old females were significantly ($P < 0.005$) heavier than the calves from the three other groups.

From a management point of view, it is noteworthy that the differences in calf body weight that exist between calves after IN-old animals and the other groups at the age of three weeks were

much reduced in July and no longer existed when the calves were recaptured in September. Contrary to this, Espmark (1980) reported that a 10% difference in birth weight between calves after high and low-plane nutrition females was maintained at the time of recapturing in September. Since both studies were carried out in the same general area the different results obtained in the two studies might indicate that the natural range conditions have been different, and that this influences the calves' ability to compensate for a low birth weight.

Varo and Varo (1971) and Bergerud (1975) have previously reported a positive correlation between calf birth weight and female body weight just prior to calving. Their results were confirmed by the present study (Fig. 5).

Haukioja and Salovaara (1978) and Nieminen et al. (1982) have suggested that small calves are more

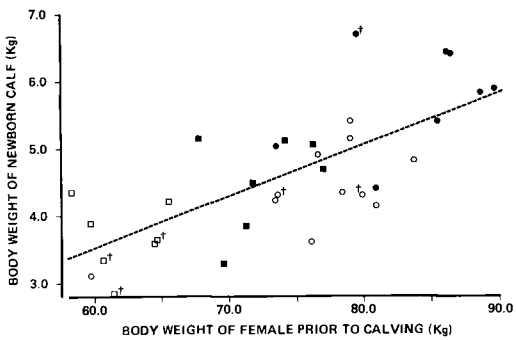

Fig. 5. The relationship between calf birth weight and weight of the pregnant female just prior to calving. Symbols as for Figs. 2 and 3. The (dotted) line was obtained by linear regression analysis and is described by the following equation:
Y = 0.076X - 1.05,
where Y is the calf birth weight in kg, and X the weight (kg) of the pregnant female. Symbols with crosses indicate individuals that died during the first three weeks *post partum*.

Fig. 5. Sammenhengen mellom kalvens fødselsvekt og vekten av den drektige simlen like før kalving, angitt med de samme symbolene som i figurene 2 og 3. Den stiplede linjen er fremkommet ved lineær regresjonsanalyse og kan beskrives med følgende formel:
Y = 0.076X - 1.05, hvor Y er kalvens fødselsvekt i kg, og X vekten (kg) av den drektige simlen umiddelbart før kalving.
Symboler som er markert med kors angir kalver som døde i løpet av de tre første ukene etter fødselen.

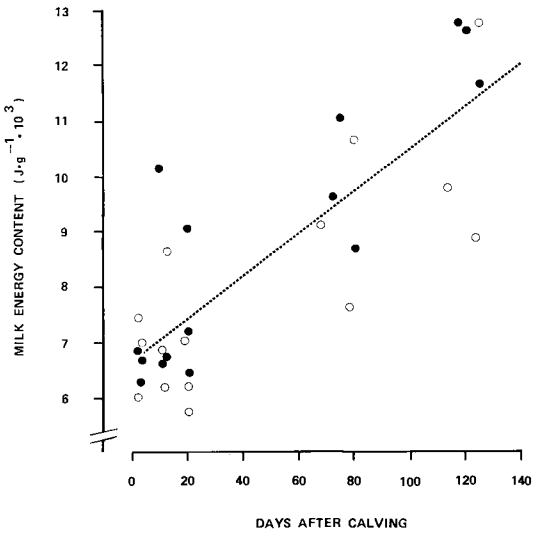

Fig. 6. Total energy content of milk as related to days after calving. Filled symbols represent milk from animals of the IN-group, while open symbols represent milk from animals of the L-group. The (dotted) line was obtained by linear regression analysis and is described by the following equation:
Y = 38X + 6692,
where Y is energy content (J·g^{-1}) of milk and X number of days after calving.

Fig. 6. Melkens totale energiinnhold i relasjon til tidspunkt etter kalving. Lukkede symboler angir prøver fra tilleggsfôrete simler, mens åpne symboler angir melkeprøver fra simler på lav-diett. Hvert punkt angir gjennomsnittsverdien for tre målinger. Den stiplede linjen er fremkommet ved lineær regresjonsanalyse og kan beskrives av følgende formel:
Y = 38X + 6692
hvor Y er melkens totale energiinnhold (J·g^{-1}), og X er antall dager etter kalving.

likely to succumb than larger ones. Our results are agreeable with this, since mortality was high among the small calves of our small L-young females, while the mortality in the other groups was very low. The fact that average body weight of «wild» calves was similar to average body weight of our large IN-old calves already in July, could also be accounted for by an early removal of small calves under natural conditions.

ACKNOWLEDGEMENTS
The cooperation of the technical staff at the Norwegian State Reindeer Research Station is greatly appreciated.

Table 3. The composition of the major constituents of milk (gram percent) from the animals in the Improved Nutrition group (IN) and the Lichen group (L) at different times *post partum*. The results are given as means ± SD of five measurements.

Tabell 3. Melkesammensetning, i gram prosent, fra dyr i tilleggsfôr gruppen (IN) og Lav-fôr gruppen (L) til forskjellig tid etter kalving. Resultatene er gitt som middelverdi ± SD for fem målinger.

Days post partum *Dager efter kalving*		2-4	10-13	19-20	58-80
Dry matter, *Tørrstoff,*	IN	23.2 ± 1.7	24.3 ± 1.5	24.3 ± 1.9	30.2 ± 2.5
Dry matter, *Tørrstoff,*	L	25.5 ± 2.8	24.0 ± 1.9	24.3 ± 1.9	29.7 ± 2.9
Fat, *Fett,*	IN	10.2 ± 1.5	11.0 ± 1.4	10.3 ± 2.0	14.7 ± 2.1
Fat, *Fett,*	L	13.2 ± 2.6	11.2 ± 0.9	10.6 ± 2.1	14.8 ± 2.3
Protein, *Protein,*	IN	7.2 ± 0.5	8.1 ± 0.5	8.3 ± 0.2	10.5 ± 0.7
Protein, *Protein,*	L	7.3 ± 0.8	7.3 ± 0.4	8.2 ± 0.7	9.6 ± 1.5
Lactose, *Melkesukker,*	IN	4.5 ± 0.6	3.9 ± 0.4	4.4 ± 0.4	3.7 ± 0.2
Lactose, *Melkesukker,*	L	3.7 ± 0.5	4.3 ± 0.2	4.3 ± 0.3	4.0 ± 0.5

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