

It is risky to rely on standard grass analyses for content of minerals

by

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On basis of practical experiences from Great and Small Vildmose in Denmark in the 2001-grazing season it can be concluded, that the average daily gain has been 30% higher for a group of dairy heifers that were offered granulated minerals from a mineral feeder, compared to a similar control group, which were not offered minerals. From an intake of 1.9 ton of mineral in the observation group the heifers have achieved an additional gain of 2.5 ton during the grazing season. It is risky to rely on standard grass analyses for the content of minerals, and therefore also on presumptions that grazing heifers through the intake of grass are sufficiently covered with macro minerals (Ca, P, Mg, Na and S), and only need extra minerals for covering of needs for trace elements (Mn, Zn, Cu, Co, I, Se). The heifers were in the concrete example from Great and Small Vildmose in deficiency of Ca, P and S, even though they took 100 gram per day of an offered mineral supplement.

1 Introduction

The use of MicroFeeder's mineral feeder for grazing animals is now widespread. The mineral feeders are self-rising and allow the use of granulated minerals, which of economic as well as physiologic reasons are optimal for offering of supplementary minerals for grazing animals. The mineral feeder was until 1999 alone sold in Denmark, as it was earlier produced in glass fiber, which makes it more expensive to produce and also to transport. The mineral feeder has since beginning of year 2000 been produced in plastic and is now sold in a number of countries, here under in Sweden, Norway, Germany, Holland, England, Ireland, Switzerland, Holland, etc. The method for feeding supplementary minerals has thus proofed its superiority.

1.1 Offering supplementary minerals to dairy heifers grazing jointly in Great and Small Vildmose in Northern Jutland

Northern Jutland County in Denmark offers joint grazing in Great and Small Vildmose, a bog area with in total 125 fences and big enough for 5,000 grazing heifers.

A big part of the herds which use the joint grazing areas in Great and Small

Vildmose have for the grazing season 2001 entered into a 5-years agreement with Vitfoss, through Northern Jutland County, about offering of necessary supplementary minerals for the heifers. Concretely this agreement has been made for 42 flocks of around 50 heifers.

2 Specially produced minerals were offered in MicroFeeder's mineral feeder

Vitfoss have in order to fulfill their part of the agreement placed a mineral feeder in each of the 42 fences, and have offered a specially produced mineral supplement, based on the following assumptions:

- An average weight of the heifers of 400 kilo, and an envisaged daily gain of 700 gram, which according to Danish feed norms means they should eat 5.4 SFU (Scandinavian Feed Units) grass per day and the amount of minerals shown in Table 2, line 8 and 9 (4).
- A quality of the grass which corresponds to perennial meadow grass in the feedstuff table (3), and with the content of minerals as shown in Table 2, line 1.

The amount of minerals in the specially produced mineral supplement from Vitfoss is shown in Table 2, line 11, as it was the intention that the heifers should eat 100 gram of minerals per day per heifer. dlj - Vester Hassing have been responsible for the practical tests dealing with weighing of the heifers; the heifers were weighed on a scale on their way to the joint grazing in the Spring, and again by return to the stable in the Autumn 20011. There were weighed in total 272 heifers from 4 different herds. The heifers were split on two groups during the grazing season: An observation group were offered minerals, while the control group didn't get any minerals (as conventional practice). The grass was sampled for analysis of the mineral content, and the results of these analyses are shown in Table 2, line 2 to 7.

3 Results and calculations

The following table shows the registrations and the results of the weighing:

Table 1 *Registrations and results of weighing.*

	Minerals	Feeding days	Total gain, kg.	Number of heifers	Average gain per day, grams
Test group	Yes – app. 100 grams	18.788	10.615	136	565

	Minerals	Feeding days	Total gain, kg.	Number of heifers	Average gain per day, grams
	per day				
Control group	No	19.250	8.123	125	422

One of the herds "forgot" to weigh their heifers, around 25, on return from grazing so their weight measurements are based on measurements of the circumference of their forepart.

The optimal gain for dairy heifers are between 650 and 700 gram per day, and the daily gain has therefore not been satisfactory for any of the groups. The gain was, however, no less than 30% higher for the observation group in comparison with the control group. This means, that by offering roughly 1.9 ton of minerals there have been achieved an additional gain of roughly 2.5 ton, so the immediate advantages are quite visible. However, the purpose of offering supplementary minerals to dairy heifers are not only to comply with their gain based needs, but also to lay the foundation for increase reproduction, milk production and health traits, such as a clear heat in an early age, a viable calf, an easy 1st calving and a high milk yield in especially the 1st lactation; all in all to achieve animals with a good condition.

The fact that the gain of the observation group was sub-optimal appears surprising, because the heifers were actually eating the planned amount of around 100 gram of minerals per day. As the amount of grass was satisfactory there are no doubt, that a great part of the explanation for this is due to the reality, that the content of minerals in the grass were far from the anticipated amounts, judged from the standard feed table information – see Table 2, line 2 - 7.

Table 2 *Results and calculations concerning supplementation of dairy heifers in Great and Small Vildmose with minerals.*

	Mineral	Calcium	Phosphorus	Magnesium	Potassium	Sodium	Sulphur	Manganese	Zinc	Copper	Selenium	
Line	Unit	Grams per kg dry matter						Mg per kg dry matter				
1	Standard analysis for perennial meadow grass	9,5	4,0	1,7	30	2,5	2,1	70	40	7	0,03	
2	Analysis from Grønvej 48	5,1	3,7	1,5	20	0,7	1,0	100	60	6		
3	Analysis from Damfenne	3,8	3,3	1,6	24	0,7	1,0	72	42	6		
4	Analysis from Ørnefenne	5,1	3,6	1,8	26	0,6	1,2	76	47	7		
5	Analysis from Ringfenne	3,3	3,6	1,3	21	0,7	0,9	97	51	3		

	Mineral	Calcium	Phosphorus	Magnesium	Potassium	Sodium	Sulphur	Manganese	Zinc	Copper	Selenium	
Line	Unit	Grams per kg dry matter						Mg per kg dry matter				
6	Analysis from Sandmose	3,0	3,1	1,4	20	0,9	0,9	83	43	6		
7	Minimum of analyses in line 2-6	3,0	3,1	1,3	20	0,6	0,9	72	42	3		
8	Norms for heifers. per kg dry matter	4,9	4,0	1,4	7,6	1,4	1,6	33	42	8	0,10	
9	Norm for heifers by intake of 6.5 kg dry matter (5.4 SFU)	31,9	26,0	9,1	49,4	9,1	10,4	215	273	54	0,65	
10	Intake with 5.4 SFU grass by minimal mineral content in the grass	19,5	20,2	8,5	130	3,9	5,9	468	273	20		
11	Intake including 5.4 SFU grass by minimal mineral content in the grass and 100 gram mineral supplement	7,6	4	7		14		400	500	90	3,00	
12	Aufnahme inkl. 5,4 FE Gras bei wenigstem Inhalt in der Analyse und 100 Gramm Mineralien	27,1	24,2	15,5	130	17,9	5,85	868	773	110	3,00	
13	Deficiency without mineral supplementation	12,4	5,9	0,7		5,2	4,6			34	0,65	
14	Deficiency with the concrete mineral supplementation	4,8	1,9				4,6					

The grass samples were not analysed for Se as it on beforehand is given that the Se content in grass is far below the animal's needs.

4 Conclusions

On basis of practical experiences from Great and Small Vildmose in Denmark in the 2001-grazing season it can be concluded, that:

- The average daily gain has been 30% higher in a group of dairy heifers that were offered granulated minerals from a mineral feeder, compared to a similar control group, which were not offered minerals. From the intake of 1.9 ton of mineral in the observation group there has been achieved an additional gain of 2.5 ton during the grazing season.
- It is risky to rely on standard grass analyses for the content of minerals, and therefore also on presumptions that grazing heifer through the grass are sufficiently covered with macro minerals (Ca, P, Mg, Na and S), and only need extra minerals for covering of needs for micro minerals (Mn, Zn, Cu, Co, I, Se). The heifers were in the concrete example from Great and Small Vildmose in deficiency of Ca, P and S, even though they took 100

gram per day of an offered mineral supplement.

- It is in general a good idea to sample the grass for analysis of the mineral content if it constitutes a big part of the feed ration, and especially if the soil quality is atypical, as for instance in bogs like in Great and Small Vildmose. Supplementary minerals can be delivered after special receipts in even small quantities.
- There will in the coming years be produced minerals for the heifers in the joint grazing in Great and Small Vildmose after a receipt based on the experiences from the grazing season 2001.

5 References

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