



ELSEVIER

Livestock Science 100 (2006) 203–215

**LIVESTOCK
SCIENCE**

www.elsevier.com/locate/livsci

Effects of feeding frequency on the performance and welfare of mature Hereford cows and their progeny

M. Manninen ^{a,*}, R. Sormunen-Cristian ^b, L. Jauhiainen ^c, S. Sankari ^d, T. Soveri ^d

^a MTT Agrifood Research Finland, North Savo Research Station, FIN-71750 Maaninka, Finland

^b MTT Agrifood Research Finland, Animal Production Research, FIN-31600 Jokioinen, Finland

^c MTT Agrifood Research Finland, Research Services, FIN-31600 Jokioinen, Finland

^d University of Helsinki, Faculty of Veterinary Medicine, Department of Clinical Veterinary Sciences, FIN-00014 University of Helsinki, Finland

Received 16 June 2005; received in revised form 30 August 2005; accepted 31 August 2005

Abstract

A study was conducted to assess the effects of daily feeding (D) vs. feeding every third day (3D) on the performance of suckler cows and calves. In treatment 3D, the cows received the entire three-day feed portion on the first feeding day. The feeding regimens were imposed during the indoor feeding period in cold circumstances with grass silage and hay offered in the proportions of 1 : 1 on an energy basis for the cows. Thirty-two mature Hereford cows with an initial live weight (LW) of 787 kg and body condition score (BCS) of 3.33 were selected for the experiment. The experiment consisted of a winter feeding period and a grazing period averaging 225 and 96 days, respectively. Indoors the cows received a daily average 94 MJ metabolizable energy. The *in vivo* digestibility of dietary organic matter was similar in both treatments. No significant differences between the treatments were observed in cow LW, BCS, milk production and calf LW. Thirty-one cows were observed to be pregnant after the mating period. In the 3D treatment the serum concentrations of urea and long-chain fatty acids were increased on the third day after feeding compared to first and second days throughout the experiment, possibly due to activation of lipolysis and proteolysis. The 3D cows spent on average more ($P < 0.001$, 9.1% vs. 4.5%) time lying and less time ($P < 0.05$, 32.9% vs. 40.1%) outdoors than the D cows. On the basis of the results, feeding every third day is an acceptable winter feeding strategy for mature suckler cows if the cows receive enough energy for maintenance and milk production.

© 2005 Elsevier B.V. All rights reserved.

Keywords: Beef; Behaviour; Blood; Body condition; Feeding frequency; Milk; Reproduction

1. Introduction

The primary methods to improve the profitability of suckler cow production are to cut the feeding costs

* Corresponding author. Tel.: +358 3 4188 3642; fax: +358 3 4188 3661.

E-mail address: merja.manninen@mtt.fi (M. Manninen).

via decreased energy intake during the indoor period (Manninen et al., 1998, 2000; Manninen and Huhta, 2001), to improve the calf per cow output in the long term, to adopt new indoor feeding strategies (Manninen and Taponen, 2004; Manninen et al., 2004) and to decrease labour and machinery costs by means of less frequent feeding. The techniques should not have any detrimental effects on cow welfare, performance and fertility to be acceptable feeding strategies for practice.

Daily supplementation of feed to cows requires a significant commitment of labour and equipment especially when cattle are maintained under extensive grazing conditions but also in indoor feeding facilities. If the supplementation frequency can be diminished without any harmful effects on cow and calf performance, savings can be realized via reduced need for labour and equipment. Feeding frequency is a well documented research subject with dairy cows (e.g. Robinson and McQueen, 1994; Shabi et al., 1999; Phillips and Rind, 2001; Dhiman et al., 2002) and beef bulls (Aronen, 1991) concerning mainly increased concentrate feeding. In the case of beef cows, the feeding frequency is reported only in some studies referring to lessened feeding of cows usually grazing native range or under extensive conditions (Chase and Hibberd, 1989; Beaty et al., 1994; Huston et al., 1999). However, no results are available concerning the effects of reduced feeding frequency on suckler cow performance during a long indoor period.

Suckler cow production is characterized by relatively low nutrient requirements. Compared to dairy cow, suckler cow milk production is much lower suggesting minor demands for daily feeding if the total supply of energy is fulfilled according to the requirements. Thus, the hypothesis of the present study was that the feeding frequency of suckler cows can be less than daily without any detrimental effects on animal performance and welfare. The present study evaluated the effects of daily feeding versus feeding every third day of mature, pregnant suckler cows on diet digestibility, cow and calf performance, milk production, dystocia cases, blood parameters and cow behaviour. Grass silage (GS) and hay (H) were used as winter feeds for the cows during the indoor feeding period in cold marginal circumstances.

2. Materials and methods

2.1. Animals and experimental design

The experiment was carried out at the Tohmajärvi Research Station located in eastern Finland where the average vegetation period is 155 days and the grazing period 100–120 days. During the winter feeding period the temperature indoors was measured at 8:00 a.m. and at 2:00 p.m.

Thirty-two multiparous Hereford (Hf) cows with an initial live weight (LW) of 787 kg (standard deviation (S.D.) 48.8) and body condition score (BCS) of 3.33 (S.D. 0.374) on 22 October were selected for the experiment. All cows, except one, were pregnant to the same Hf bull. The treatments consisted of two winter feeding strategies which were daily feeding (D) and feeding every third day (3D) of roughages (GS and H). In treatment 3D, the cows received the entire three-day feed portion on the first feeding day. Initial LW, BCS and predicted calving date (gestational age assessed by ultrasonographic foetometry) were used to allocate the animals to groups and thereafter the treatments were randomly assigned to groups.

During winter the cows were in an uninsulated barn in four pens. Each pen was 74 m² including 53 m² of bedding area and 21 m² of passage. Straw and peat were used as bedding materials. The animals were group-fed, eight animals per pen and two pens per treatment. The experiment consisted of two main periods, a winter feeding period and a grazing period averaging 225 and 96 days, respectively. The winter feeding contained three periods which were from the start to the onset of pre partum feeding (P I; 95 days, S.D. 3.6), pre partum feeding (P II; 65 days, S.D. 18.6) and post partum feeding before the grazing (P III; 65 days, S.D. 19.0). The grazing season commenced on 3 June and the experiment ended on 7 September. In addition to the animal performance data evaluated in the present experiment, the labour demand during the indoor feeding period was measured by the Work Efficiency Institute and published by Palva et al. (2004).

2.2. Feeds and feeding

Wilted GS was harvested on 18–19 August and on 8–9 September using a mower conditioner and a

Download English Version:

<https://daneshyari.com/en/article/2449161>

Download Persian Version:

<https://daneshyari.com/article/2449161>

[Daneshyari.com](https://daneshyari.com)