

Enhancing animal health security and food safety in organic livestock production

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Hyperketonaemia risk lower in organic cows housed in free stalls

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Introduction

Hyperketonaemia is a common condition of dairy cows in early lactation, defined as an increase of ketone bodies beyond normal levels in blood, milk and urine. It is caused by negative energy balance, leading to mobilisation of the fat reserves of the body and increased production of ketone bodies. Hyperketonaemia causes financial loss by decreasing milk production, and by predisposing to other diseases. The purpose of this study was to explore the incidence of hyperketonaemia and its association with some predisposing factors in organic and conventional dairy herds.

Material and methods

In the Finnish province of South-Savo, all organic and a randomly selected sample of conventional dairy farms, were asked to participate. Altogether 10 organic (5 tie stall and 5 loose housing systems) and 13 conventional farms (all tie stalls) volunteered. Information was collected by interviewing the farmers, by making observations during two farm visits and from the national herd health recording database. Farmers collected three milk samples, at weekly intervals, 3-5 weeks after calving, from all of the cows that calved between October 2001 and April 2002. All three samples were collected from 123 organic and 103 conventional cows. Milk acetone was detected by flow-injection-analysis-technique. Cows were divided into normal and hyperketonaemic, based on their highest acetone value, with the cut off value of 2.5 mg/100ml. Hyperketonaemia risk and its association with predisposing factors was modelled with GEE population-averaged mixed model, and the association between hyperketonaemia and lactation curve with Greenhouse-Geisser variance analysis.

Results

The median incidence of hyperketonaemia was 18% at herd level, but there was a great variability between individual herds (0-50% in organic, and 0-86% in conventional). The risk for hyperketonaemia was significantly lower in cows in loose housing systems, being lowest (0.05) for 1st parity cows in organic loose housing, and highest (0.42) for 3rd parity and older cows in organic tie stalls. The level and form of the lactation curve differed significantly between normal and hyperketonaemic organic cows. The difference in the mean energy-corrected milk production between the ketonaemia groups in organic cows was non-significant, but a marked trend was noted, suggesting that hyperketonaemia can be more common among high producers

Conclusions

The variation in the incidence of hyperketonaemia is marked between individual herds, and even though organic farms have some feeding related factors predisposing to hyperketonaemia, there are also some management practices (especially in loose housing systems) which might act as preventive factors. However, it may be advisable for organic farmers to favour moderate milk production when selecting cows for a herd.