

Oral presentation

## Prenatal death in Icelandic cattle

Baldur Helgi Benjamínsson

Address: Association of dairy and beef cattle farmers, Bitruháls 1, IS-110 Reykjavík, Iceland

Email: Baldur Helgi Benjamínsson - bhb@naut.is

from Perinatal Death In Domestic Animals: The 20th Symposium of the Nordic Committee for Veterinary Scientific Cooperation (NKVet) Reykjavik, Iceland. 26–27 April 2007

Published: 12 December 2007

*Acta Veterinaria Scandinavica* 2007, **49**(Suppl 1):S16 doi:10.1186/1751-0147-49-S1-S16

This abstract is available from: <http://www.actavetscand.com/content/49/S1/S16>

© 2007 Benjamínsson; licensee BioMed Central Ltd.

### Introduction

The main aim of this article is to give an overview of the research done in the field of prenatal death in Icelandic cattle in the recent years. So far, no single reason has been found for the massive rate of stillborn calves in this population. It seems reasonable to suggest that it's a result of complex interaction of many factors. Since March 2006, a big project in this area has been ongoing, divided into seven sections:

1. Reasons for stillbirths among 1st. calving heifers
2. The effect of feeding on stillbirth rate
3. Effects of ensilageing on vit. E
4. Behaviour of cows around calving and stillbirth rate
5. Se fertilizer on cultivated grassland
6. Se fertilizer on barley
7. Genetic factors effecting stillbirth rate

The results of this project are expected to be presented and published in February 2008. The manager is Prof. Magnús B. Jónsson, at The Icelandic Agricultural University.

### Background

The stillbirth rate in the Icelandic dairy cattle population has been increasing rapidly in recent years, according to figures from the dairy herd improvement scheme. In the early 1980s it was around 5% (Jónmundsson, oral refer-

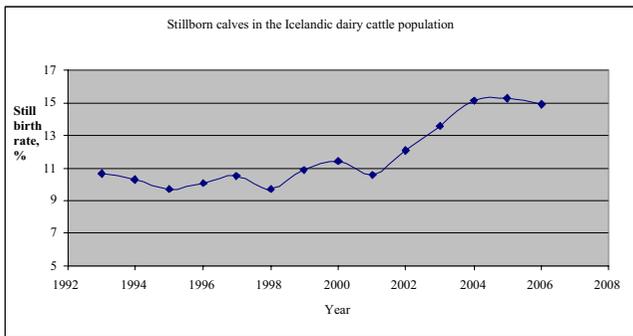
ence), but as shown in Figure 1 it has risen from around 10% in the last decade, to an all-time high of over 15% in 2005. Last year it went down for the first time in years.

In 2001 Benjamínsson [1] studied some factors that might affect stillbirth rate in cattle. The study was based upon data from the dairy herd improvement scheme. Information was about 158,704 calvings in the period from 1.1.1993 to November 2000. The main factors were as follows:

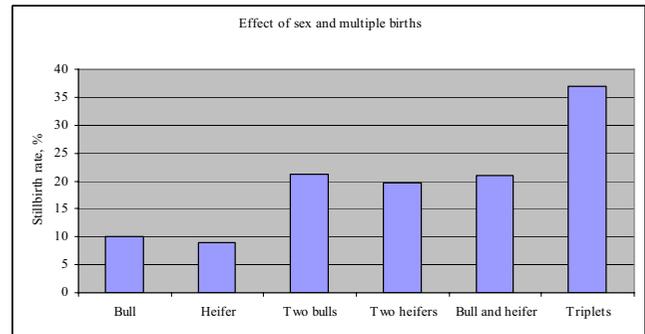
1. Calving number
2. Effect of the sex of the calf, multiple birth (twins, triplets)
3. Effect of age at first calving
4. Length of gestation
5. Sire of calf
6. Effect of degree of inbreeding, both in dam and calf, 1st calving heifers only

Other factors that were examined but showed no significance were year of calving, region, herd size and average yield in herd.

There were large variations between the 801 herds in the study. The stillbirth rate ranged from 1.7% to 29.6%.



**Figure 1**  
Trend in stillbirth rate of Icelandic dairy cattle, 1993–2006.

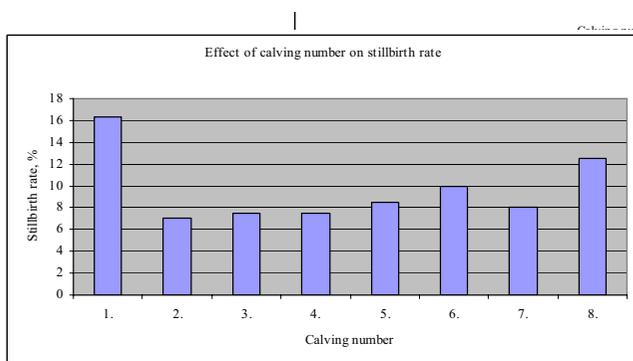


**Figure 3**  
Effect of sex and multiple births.

As shown in Figure 2, the number of calvings has quite significant effect on the stillbirth rate, as it is twice as high in 1. calf heifers than in older cows. The reason why the very old ones (8. calf) are so high is unexplained, but one has to remark that such old cows were quite few in the data set.

Effects of sex and multiple births were also considerable as shown in Figure 3. Bull calves tend to be at higher risk of being stillborn than heifer calves and the risk is also considerably higher when multiple births occur. In recent years the rate for 1. calf heifers has been much higher than shown here, it has been close to 22–25%.

The gap between stillbirth rate for single-born bulls and heifers has been increasing during recent years. In 2004 the stillbirth rate for bulls was 17% while it was 13% for heifers [2].



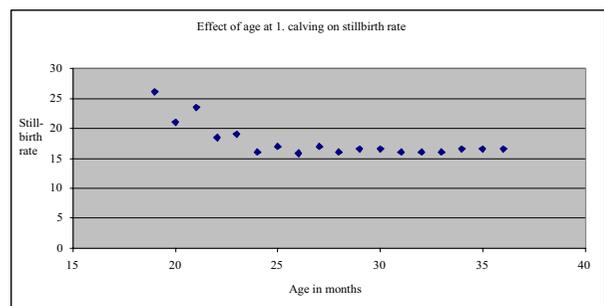
**Figure 2**  
Effect of calving number on stillbirth rate.

Age at 1. calving had significant effect up to 24 months of age, but the stillbirth rate was quite constant after that, as shown in Figure 4.

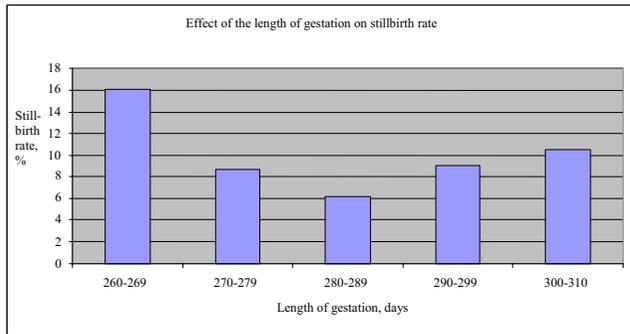
The length of gestation had a significant effect on the stillbirth rate. In the study, the average length of gestation was 286.4 days with a standard deviation of 6.9 days. The more the length of gestation deviated from the mean, the more likely the calf is to be stillborn, especially if the gestation is shorter than normal, as shown in Figure 5. In the herd recording scheme, abortion is defined as gestation shorter than 250 days.

In this investigation the effect of the sire of calf was huge. For sires with more than 50 recorded offspring, the stillbirth rate varied from <3% to >20%, although one has to take into account that A.I. bulls were used on the minority of virgin heifers in the period that data collection took place.

The effect of inbreeding was perhaps the most significant of all in the investigation. As shown in Figure 6, the RR for stillbirth increases quite rapidly as the degree of inbred-



**Figure 4**  
Effects of age at 1. calving on stillbirth rate.

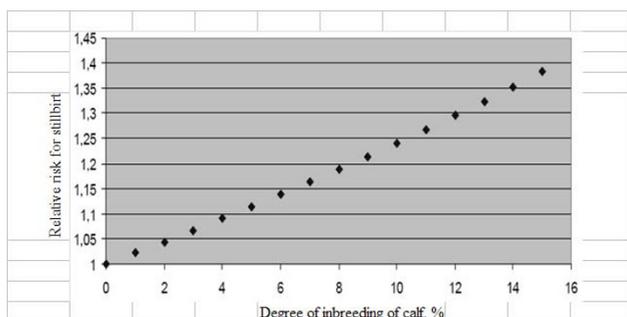


**Figure 5**  
Effects of the length of gestation on stillbirth rate.

ing of the calf increases. The effect of degree of inbreeding of the dam was not as clear, although significant.

In the fall of 2004, a survey [3] was carried out among 70 farms with high (>25%, 55 farms) and low (<10%, 15 farms) stillbirth rates in calves in the period from 2000–2003. The aim of the survey was to investigate whether there were any differences in management practices on these two "types" of farms. In short there were no obvious differences, although the "low" farms tended more to use A.I. bulls on virgin heifers, so the expected calving data are better known there. The adaption period of the heifers in the cow herd was also longer on these farms. The housing for young stock also seemed better on these farms. Use of concentrates during the last month of gestation was little higher on the "high" farms, which could increase the risk of dystocia and therefore stillborn calves.

The same farmers as in the previous survey were asked to record calving procedures from August 2004 to January 2005. Survey forms were sent to 90 farmers; 27 of them filled out the forms, with information on 687 calvings. In this survey, 18.9% of the calves were stillborn.



**Figure 6**  
Effects of degree of inbreeding in the calf on stillbirth rate.

No calving difficulties were recorded in 73.4% of calvings, 4.7% of the calves came backwards and calving difficulties due to very large calf was recorded in 6.7% of all calvings. Other reasons and unknown were roughly 15%.

In over half of the calvings no assistance was needed, or 55.5%. Slight assistance was given in 28.2% of calvings, much assistance in 11.6%, veterinarian assistance was given in 2.6% of calvings, and caesarian surgery was carried out on two cows, or 0.3%.

If the calves were stillborn, the farmers were asked to record the time of death: 7.1% of the calves were dead long before the calving, and beginning to rot; 40.9% of the calves had died in the last 24 hours before calving and 35.4% of them died during calving; 6.3% of them died in the first hours or days after calving, and in 10.2% of calvings the estimated time of death was not recorded.

## References

1. Benjaminsson BH: **Rannsókn á kálfadauða í íslenska kúastofninum. (Investigation of stillbirths in the Icelandic dairy cattle population) [In Icelandic].** Freyr 2001, **97(4-5):**40-45.
2. Jónmundsson JV: **Niðurstöður úr skýrsluhaldi nautgripaæktarinnar árið 2004. (Results from the dairy herd improvement scheme 2004) [In Icelandic].** Freyr 2005, **101:**24-27.
3. Benjaminsson BH, Hardarson GH, Ólafsson T: **Munur á meðferð og aðbúnaði gripa á búum með mikil og lítil vanhöld kálfa. Helstu niðurstöður könnunar. (Differences in management on farms with high and low stillbirth rate of calves; results of survey) [In Icelandic].** Fræðaping landbúnaðarins 2005:104-115.

Publish with **BioMed Central** and every scientist can read your work free of charge

"BioMed Central will be the most significant development for disseminating the results of biomedical research in our lifetime."

Sir Paul Nurse, Cancer Research UK

Your research papers will be:

- available free of charge to the entire biomedical community
- peer reviewed and published immediately upon acceptance
- cited in PubMed and archived on PubMed Central
- yours — you keep the copyright

Submit your manuscript here:  
[http://www.biomedcentral.com/info/publishing\\_adv.asp](http://www.biomedcentral.com/info/publishing_adv.asp)

