McIlmoyle & Associates

Animal Nutrition & Agricultural Consultants
Agricultural Recruitment Specialists

Dairy Solutions – Dairy Cow Fertility

Can nutrition and management alleviate low fertility in high yielding cows?

This was the central issue discussed at a 2-day seminar held in Dublin at the end of October 2005. Over 200 delegates and research scientists from Europe and USA attended the meeting to hear 14, world renowned speakers put forward their views and answers to this very important question.

Professor David Beever from UK defined the extent of the problem, using data published by Mee (2004):-

- first service calving rate had fallen from 60% to 54%
- calving interval had been extended from 386 days to 396 days
- cows with abnormal cycles had increased from 13% to 26%

Various explanations for the decline in fertility, which has major cost implications for dairy farmers, were put forward as follows:-

Genetics:-

- selection for milk yield over many years and generations
- low heritability of fertility
- in-breeding, which had lead some farmers to turn to cross-breeding in an attempt to resolve the problem

Management:-

- larger herds
- more cows/labour unit
- scarcity of skilled labour
- reduced capital investment

Nutrition:-

- negative energy balance in early lactation
- excessive body weight loss in early lactation
- body condition score loss in excess of 1 unit between calving and service

Dry cow management

Dry cow management was identified as having an important role to play in improving fertility.

Calving was a major insult to a cow's well-being. Most production disorders occurred within 2 weeks of calving and in some herds, over 50% of cows fail to calve without problems.

Reducing the number of cows with problems was vital if fertility was to be improved and management during both the 'far-off' and 'close-up' periods of the dry period was key. During the dry period, the target dry matter intake was 2% of body weight, or approximately 12kg DM per day. Energy intake should be 100 MJ/day, sufficient to meet the demands of maintenance + a growing foetus + mammary development.

A Negative Energy Balance (NEB) during the early lactation period lead to a sharp decline in Body Condition Score (BCS) and a drop in blood sugar levels. A loss of 1 unit of BCS in early lactation was excessive (50-70kg liveweight loss) and would inevitably lead to problems getting high yielding cows back in calf. Excessive protein in the diet aggravated NEB, as high protein intakes tended to promote milk output and an increased demand for energy for milk production.

Early embryo death in Holstein Friesians had increased dramatically during the past 25 years. For example, British Friesians in 1980 had early embryo deaths at 28% compared with 43% for modern day Holstein Friesians. Late embryo deaths had stayed relatively constant at approximately 7% over the same period. Combining these two figures resulted in a sharp decline in overall calving rate from 55% to 40% over the 25 year period.

Lameness

Lameness was considered to have a major impact on fertility. The cost of lameness was estimated to be £172/cow, with an incidence of 38-55 cases per 100 cows in the herd. Since horn growth took 6-8 weeks to appear, it was not surprising that most cases of lameness appeared 8-10 weeks after calving. Hence, nutrition at calving was vital if the incidence of lameness was to be reduced. The importance of Zinc and Biotin in the diet was stressed, with a daily intake of Biotin suggested at 10-20mg/day.

Fertility Targets

1) Normal uterine involution by day 50 after calving
2) Ovulation – 90% of cows will ovulate by day 42 after calving
3) Detection – 85% of cows should be detected per cycle
4) Conception to AI – 60% of cows should be capable of conceiving to first insemination
5) Retained foetal membranes – if the placenta was retained more that 12 hours, conception rates would be reduced.

Oestrus Detection

Significant differences between low yielders and high yielders were noted with regard to oestrus detection:

Oestrus detection differences

	Low yielders	**High Yielders**
No of cows	40	31
Oestrus duration (hours)	11.9	7.0
Short duration/high intensity	32%	53%
Time standing (minutes)	28±19	22±13