The following forms the basis of an article entitled ï¿½Milk Protein Indicator of Cow Fertilityï¿½ which appeared in the May-June, 2003 Issue of The Australian Dairfarmer.

An update on the association between milk protein percentage and dairy cow reproductive performance

By Dr. Jack Fahey*

In a previous article (The Australian Dairyfarmer September/October 2002, pages 18-19) I discussed the association between milk protein percentage and reproductive performance. This article presents some of the latest findings of our initial analysis of data from the InCalf project (Dairy Research and Development Corporation, DRDC). In this analysis the InCalf dataset was modified to only include Holstein-Friesian cows with between 1 and 5 milk production records during the first 120 days of lactation in seasonal-calving herds that carried out AI for at least the first 6 weeks of the mating period. This subset comprised of 8,795 cows in 66 herds. Cows in the subset were then divided into 4 quartiles based on early lactation milk protein percentage and 5 intervals from calving to mating start date.

Our analyses showed that milk protein percentage and the interval from calving to mating start date were strongly associated with reproductive performance.

Milk protein percentage

The mean 3-week submission rate and 6-week in-calf rate were lower and the 21-week not in-calf rate was higher for cows in the lowest compared to the highest quartiles for milk protein percentage (Figure 1).

The association between milk protein percentage and reproductive performance was driven mainly by the incidence of non-cycling cows with consequent effects on 3-week submission rate.

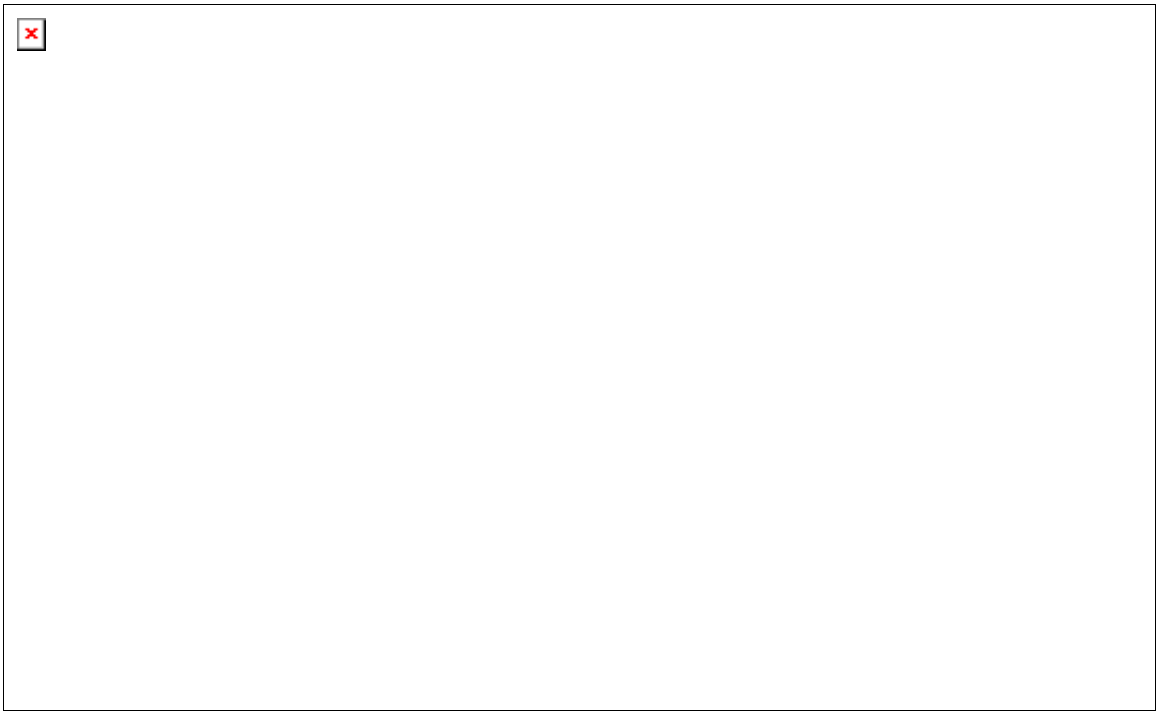
As heat detection efficiency was high in the InCalf herds (about 93%), this suggests that the majority of cows not submitted for AI were in fact non-cyclers. Previous work has shown that cows which do not cycle for prolonged periods after calving have lower submission, conception and in-calf rates and a greater probability of being culled for failure to conceive compared to cycling herd mates. Also, cows that cycle once or more before first insemination have higher fertility than cows inseminated at first heat. This emphasises the importance of getting cows to cycle as soon as possible after calving so that cows have undergone a number of cycles prior to first AI.

Figure 1: Relationships between 3-week submission rate, 6-week in-calf rate, 21-week in-calf rate and milk protein %.

Interval from calving to mating start date

It is well recognised that a short interval from calving to mating is negatively associated with conception success. More than a quarter (26%) of all cows in this study had calved less than 42 days at mating start date (Figure 2). Of these cows, 47% were submitted for AI in the first 3 weeks of mating, 38% were in-calf in the first 6 weeks of mating and 19% were not in-calf after 21 weeks of mating. The latter figure represented 50% of all the cows not in-calf after 21 weeks of mating.

Figure 2: Relationships between 3-week submission rate, 6-week in-calf rate, 21-week in-calf rate and interval from calving to mating start date.



Late calving cows and cows with low milk protein percentage

Late calving cows with low milk protein percentage were at the greatest risk of not being submitted for AI and

remaining not in-calf at the end of a relatively long mating period of 21 weeks. Remember, a mating period of as little as 12 weeks is required to maintain a seasonal calving pattern. In the cows calved less than 3 weeks at mating start date, 26.3% were not in-calf after 21 weeks of mating. Although there is a negative relationship between reproductive performance and the interval from calving to mating, this does not explain why such a high proportion of cows were not in-calf in this category, considering that such cows had ample opportunity (21 weeks) to be served and to conceive. Also, these cows had prolonged exposure to stock bulls which would potentially overcome any defects in farmer-based heat detection efficiency.

These and other factors which may affect the relationship between milk protein percent and reproductive performance such as the influence of cow age, genetics, milk production or whether a cow was induced to calve or not will be the subject of further analysis.

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