

Non-return rate and calving interval determine fertility index

Select for better fertility

The Netherlands adjusted its index for fertility in April to make it an even better tool for breeders to use. The role of non-return rate figures has become more important, as has calving interval.

We highlight how various factors influence fertility.

text **Hans Siemes (Veepro Holland)**

There are few subjects that receive more attention from dairy farmers than daughter fertility. Their key question is: 'How can I get my cows in calf, on time, using as few doses of semen as possible – and preferably not more than one?' With herds expanding, the importance of good fertility is increasing.

At these larger operations, producers and their staff have less time and fewer opportunities to take a good look at every individual cow. They want cows that don't need any special care or attention, particularly where fertility is concerned. The genetic potential of a cow does influence her fertility by about 10%.

"At first glance this doesn't seem so important, but that is a misconception", says Johan van Arendonk, Wageningen University's professor of animal breeding and genetics. "You see differences between bulls in terms of daughter fertility. And they are differences that really make an impact. With sire selection, daughter fertility really can be improved."

Different phases

Various factors influence fertility. Management is the most important one by far, according to Dr Van Arendonk. This involves the observations and choices of the producer. Within that process, he distinguishes different phases, the first of which is heat detection.

"Ask yourself: do your cows show strong signs of oestrus? And are you observant enough? The environment also plays a role in this. With a slippery floor, cows show heat less well. On expanding farms there is less and less time available for heat detection of the individual cow."

pregnancy. This is a combined action of cow and embryo. A fertilised egg should not be hindered if it wants to become implanted. And the cow's health does play an important role here. This is also closely connected with the right environment and good nutrition which makes the whole picture quite complex. In all of this the producer is a significant factor, stresses Dr Van Arendonk.

Genetic correlation

Increased milk production and fertility are at odds with one another. The basis being an unfavourable genetic correlation. While milk production in general has increased significantly during the past few decades, fertility has deteriorated. And that's not at all what

The second phase is the right time for insemination. That is determined by the producer, but also depends on the inseminator being on-farm at the right time. "Twelve hours too early or 12 hours too late has an influence on conception rate."

The third phase is the occurrence of a



producers want. At the very least, they need this negative trend to stop. But better still, they would like to see an improvement.

Since Dutch breeding also aims to increase milk production, particularly components, it is quite a challenge to maintain the fertility level as it is. That shows up in the Dutch breeding goal. Fertility should at least remain at the same level.

“As a prominent breeding country we cannot afford a further decline”, says Dr Van Arendonk. In 2008 this was translated into a heavier weighting on fertility in the breeding goal. The emphasis on fertility in the sire index (NVI) increased. Bulls that score poorly for fertility, therefore, dropped in the sire rankings.

Non-return rate

Two elements determine the index for fertility – non-return rate and calving interval. Until recently, calving interval received the heaviest weighting

in the calculations. The ‘breeding value estimation and publication committee’, under the leadership of Dr Van Arendonk, has advised the NVO – the organisation that calculates and publishes indexes – to place a heavier emphasis on non-return rate. This was implemented with the recent index release in April 2009. The importance of non-return rate in the fertility index has increased from 15% to 50%. And, at the same time, the weighting for calving interval dropped from 85% to 50%. Both elements are now weighted equally.

Non-return rate figures indicate that a cow does not return for repeat breeding within 56 days after the first insemination. This does not always mean that the cow is actually in-calf. In some cases the producer gives up trying to get the cow pregnant and decides to cull the cow. Non-return rate can be easily measured for a large number of animals and for that reason is used as information to improve fertility.

But for the majority of animals, non-return rate is a good indication of pregnancy. Around 65% of first inseminations result in pregnancies.

Dr Van Arendonk believes that the shift to non-return rate is a good development because it gives breeders better feed back. “It says something about the chances of a pregnancy when a producer decides to inseminate. A higher non-return rate gives the producer more opportunities to get cows in-calf at the desired moment. Non-return rate can also be influenced by using bulls with high fertility.”

Calving interval

Calving interval, too, is an important indicator of fertility. It is dependent on farm type and circumstances within a country. On the pasture-based units in Ireland and New Zealand, for example, the calving interval is fixed at 12 months. In the Netherlands, on the other hand, there is barely any mention of a seasonal calving pattern as cows calve all year round.

Within that calving interval, the dry period should not be too long. When a cow is dry for too long, the average milk production decreases, which results in a financial loss. The losses due to longer calving intervals become less when the persistency of the cow increases and the cow is able to produce for a longer period of time. However, Dr Van Arendonk also explains that, in terms of health, a slightly longer calving interval can be an advantage too.

“The majority of health problems occur at the beginning of the lactation, while at the end there are the fewest,” he points out. “The length of the lactations continues to increase. And cows are more and more able to maintain their milk production for a longer period of time.

He has no problem justifying a longer calving interval under these circumstances. As far as he is concerned, more attention could be given to persistency and the ability of animals to continue producing, also beyond 305 days.

He also thinks that the international norm for a production of 305 days could be changed.

“Preferably to 360 days, since this better reflects what is taking place in a large number of countries where a significant portion of the animals have a calving interval longer than 365 days”, he says. |



The right time for insemination is crucial to the chances of conception. Twelve hours too late or too early makes a huge difference to conception rate