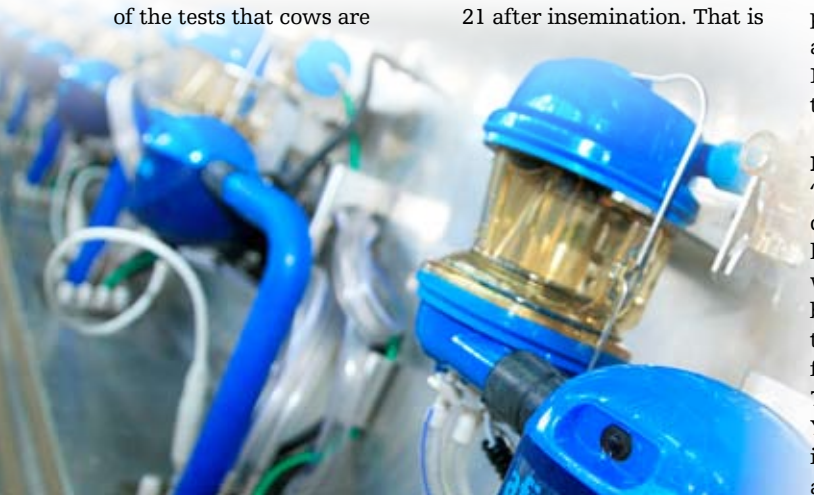
Pregnancy test via milk

Determining a pregnancy through the milk. Wageningen University is researching the possibilities. The first steps have been taken. Researchers have identified five milk proteins that release a signal in the case of a pregnancy. A pregnancy test via the milk comes within sight.

Dairy farmers want to know whether a cow is in-calf. With tools such as ultrasound equipment or measuring for the progesterone hormone, this can be determined. Wageningen UR is busy developing a new method: predicting pregnancy via the milk, or, to be even more precise, via milk proteins. That is unique in the world. It is already known that it is possible, however, researcher Henri Woelders is cautious about stating whether in the end it will result in a viable and affordable test for the dairy industry.

Why the caution?
"You aim for a high level of certainty and reliability. If you know from 80 percent of the tests that cows are pregnant, that certainly is nice, but it isn't very meaningful yet. You want it to be 95 percent or more. In a trial with 32 cows, we have looked at the sensitivity and the specificity. Sensitivity is the extent to which you can actually identify a pregnancy, specificity indicates whether you can identify an animal that is not in-calf. The sensitivity was high, while the specificity ended up at 85 percent. That is high for a first experiment, but the number of 32 cows was too small to exclude the coincidence factor. When you analyse combinations of 780 proteins from 32 cows, the possibility of errors in estimation is high. We also want to take samples earlier – before day 21 after insemination. That is important for farmers. If there is no pregnancy, they can keep a closer eye on these cows for a heat during the next cycle.'



What will be the next step?
"We now want to conduct a larger trial. We are in the process of making preparations. First goal is that we determine that it is possible. Second goal is to develop a testing method that is available for the field. That will happen in conjunction with a firm that will market it. You could think of something like the pregnancy tests that are available for women, where a small stick changing colour indicates whether a woman is pregnant or not."

When will a test like this for pregnancy proteins become available?
"I don't dare make a prediction. First we will have to see if the large trial actually provides us with a testing method that offers a high level of certainty about whether a cow is pregnant or not. That trial will easily take a year or two. After that another three years will be necessary to develop a test that is ready for use in the field."

And is it better?
"Today, progesterone can be tested inline, however, with such a test you cannot determine with certainty that a cow is pregnant. Pregnant cows have an increased progesterone level, but non-pregnant cows also have this around ten days after a heat. Measuring progesterone via the milk is too expensive."

Is it revolutionary?
"Yes, as far as we can determine. We are more or less working in the same way as with genomics and biomarkers. We apply new techniques, that are also used for human health. There are 780 traceable proteins in milk. You don't look for a specific individual protein, but for a combination of proteins which are distinguishable and as such also release a signal when a cow is in-calf. That is called proteomics. We have found five proteins that are clearly distinguishable."

Henri Woelders is a researcher at Wageningen UR Livestock Research. He is involved in research on the reproduction and fertility of domestic animals used in agriculture. For measuring pregnancies in milk protein, he has worked closely together with Yvette de Haas.

Are there also proteins that indicate a heat?
"We have not done any research on this yet, but in theory that should be the case. During the heat cycle, you see that the hormones respond, just like during a pregnancy. We don't know whether there are proteins that release a signal with heat, but we certainly need to look into their existence. We are busy formulating research programs for this purpose. It would be an ideal instrument for farmers to trace heat via proteins in the milk. Heat is an important point, anyhow. It is not always easy to detect, and with the expanding herds, farmers also can give less attention to each individual cow for heat detection."

What else is there in those 780 traceable proteins?
"Perhaps there will be other traits that can be identified, such as general health or mastitis, although for the latter there are also other methods available for identification, such as somatic cell count." |