

ZON and fertility cycle maintenance

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Like most problems on the dairy farm, management is a key factor and for fertility the primary issues are nutrition and heat detection. Incorrectly balanced rations, poor forage quality, acidosis and competition for feed space will all extend the period of negative energy balance, delaying resumption of the fertility cycle.

Add the limited resources applied to heat observation on many farms, especially given the apparent penchant cows have for bulling in the early hours, and declining dairy herd fertility could be defined as primarily a management issue.

But given the growing difficulty in spotting cows bulling, with oestrus

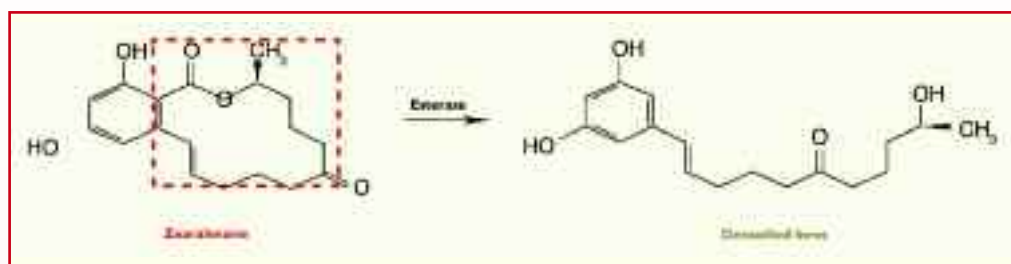


Fig. 1. Biotransformation of zearalenone (ZON). The change in structure deactivates its ability to interfere with oestrogen.

subdued or shortened and with conception rates also disappointing, clearly other factors are increasingly involved.

Attention has justifiably focused on

veterinary problems such as leptospirosis, metritis, BVD and IBR, and next in line are issues related to modern dairy cow diets, particularly mycotoxins and beta-carotene deficiency.

Rise in mycotoxin exposure

TMR feeding, increased use of maize and wholecrop silages and wetter, warmer growing conditions have all contributed to the rise in exposure to mycotoxins. Of equal importance is the increase in cow performance and herd size which has placed greater stresses on the animal and increased her susceptibility.

Produced by fusarium moulds, ZON (zearalenone) is the most important mycotoxin directly linked to negative effects on fertility.

With a structure similar to oestrogen, ZON is able to mimic this essential fertility hormone, bind to the oestrogen receptors in the animal and disrupt the hormonal cycle.

In the most acute cases ZON causes prolapses, cystic ovaries and hypertrophy (swelling) of the uterus, but more common low level infections result in poor conception rates and subdued oestrus with short or silent heats.

Control of ZON in the rumen has proved difficult as it is not readily absorbed by clays or similar materials and so mycotoxin binders have limited impact.

The most effective remedy appears to be the use of enzymes to alter the structure of the ZON molecule, neutralising its ability to mimic oestrogen (Fig. 1).

But a major difficulty in confirming

ZON as a specific cause of infertility in a herd is that beta-carotene deficiency will often result in similar symptoms.

Beta-carotene's role in the fertility cycle includes boosting oestrus and the quality of follicles and embryos, with deficiency likely to show as silent heats, poor conception and embryo re-absorption.

Cows are unable to store beta-carotene so require a regular daily intake, no problem for cows at pasture as grass contains high levels, but most forages are inherently low in beta-carotene and levels decline during storage.

Herds that are winter housed may well benefit from supplementation during early lactation, while those on 365 day TMR rations will need routine supplies to avoid a negative impact on fertility.

Nutritional intervention

Where nutritional intervention is required, supplementation with Mycatene at either 50g or 75g per cow per day, depending on the extent of the challenge, will both ensure the deactivation of ZON and prevent beta-carotene deficiency.

Comprising three active ingredients: Mycofix Plus 3.E – the triple action anti-mycotoxin from Biomin; Rovimix Beta-carotene from DSM; and additional vitamin E to ensure the Rovimix is targeted at the follicle; Mycatene offers a new approach to fertility management through nutrition. ■

References are available from the author:
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