Is an early pregnancy check enough or should gestation be reconfirmed?

Ultrasound reproductive management has long since come out of its pioneering phase (90s), to become a universally accepted complimentary technique. Most of those involved in bovine reproduction use an ultra-portable or portable ultrasound unit, at least for what concerns the pregnancy diagnosis.

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In the last 30 years, the efficiency and accuracy of this technique has become a fundamental examination for reproduction and internal medicine of both males and females.

Despite the ongoing widespread use of the palpation technique and the more recent use of biochemical tests, year after year, the use of ultrasound to detect early pregnancy continues to increase in popularity, and it will quickly come to supplant the palpation technique.

Economic aspects

A 30-day pregnancy costs the breeder about $300; obviously this value varies depending on several factors, including parity, DIM and geography. The goal of every farmer is to get the cows/heifers pregnant as soon as possible.

The greatest economic performance in an intensive system is obtained by getting a multiparous animal between 60-70 DIM and a primiparous animal between 75-85 DIM pregnant.

In general, we can say that the goal must be to inseminate 90-95% of the herd within 100 DIM, with a conception rate ≥40%.

While the choice of a first insemination at 60 or 90 days is still the subject of open discussion, what we all agree on is that non-pregnant cows must be identified as soon as possible. For this reason, to use a technique that allows accurate detection of early pregnancy is fundamental.

By combining a re-synchronisation program with ultrasound early pregnancy diagnosis, it is possible to reduce the inter-AI interval to 35 days for non-pregnant cows with a corpus luteum (CL), and 42 days for non-pregnant cows without a CL.

The desired conception rate for second and subsequent AIs must be ≥35%. By doing so at 150-160 DIM, 70-75% of the cows will be pregnant, and the non-pregnant cows will have received no less than three AI.

According to this protocol, at 200-220 DIM no less than 90% of the herd will be pregnant and non-pregnant animals can be culled.

The technique

This strategy has its foundation in the diagnosis of early gestation made with an ultrasound unit. The early ultrasound diagnosis of gestation is carried out in three steps:

- Ultrasound check of the ovaries, to determine if there is a CL, where it is located (right or left), and if there is more than one CL.

The presence of two CL must always lead to suspicion of a twin gestation, whose diagnosis itself has an aggregate value for the early diagnosis of gestation (Fig. 2).

- Detection of the presence of fluid in the uterine horn ipsi-lateral to the CL and/or in the contrlateral horn. Unfortunately, most sonographers only evaluate the presence of fluid in the uterus to make the diagnosis of gestation.

This is an incorrect approach, which greatly reduces the accuracy of the diagnosis.

The diagnosis of gestation made on the basis of the mere presence of fluid in the uterus, has a low accuracy because the fluid may be present for physiological reasons (uterus before and during oestrus, uterus in the first 36-48 hours after ovulation), or pathological (mucometra) (Figs. 3-4).

If the diagnosis of gestation is made on the sole basis of the presence of uterine fluid, no less than 27-28% of cows with gestation 'loss' will be found at the second pregnancy check after 2-4 weeks.

Obviously, these are not just gestation losses, many of them are incorrect pregnancy diagnoses.

- Detection of the presence of the embryo or embryos, in the case of twin gestation. Only the presence of the embryo guarantees pregnancy.

Obviously we must not limit ourselves to the identification of the embryo alone, but we must establish whether the gestation is regular (live embryo, sub-viable embryo, dead embryo) and if there is a single or bilateral twin gestation (Fig. 5).

unilateral

Fig. 1. US pregnancy diagnosis.

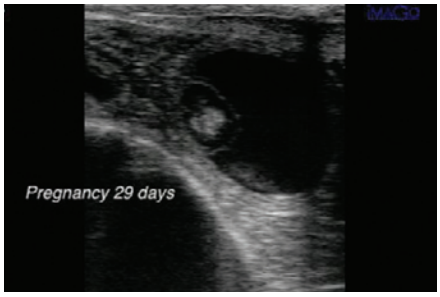


Fig. 2. Cavitary CL.

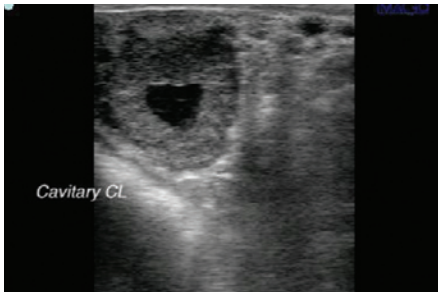
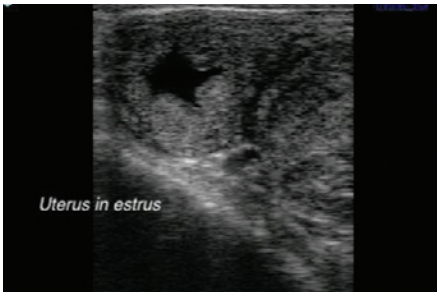


Fig. 3. Uterus in oestrus.



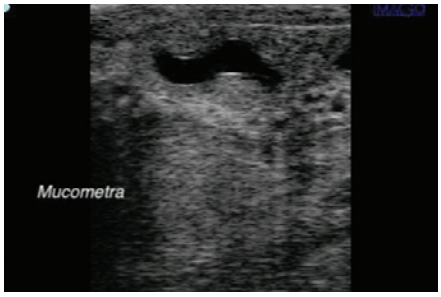


Fig. 4. Uterus with mucometra.

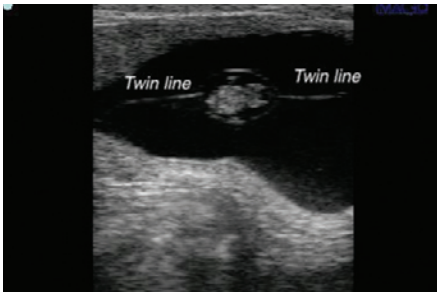


Fig. 5. Twin pregnancy.

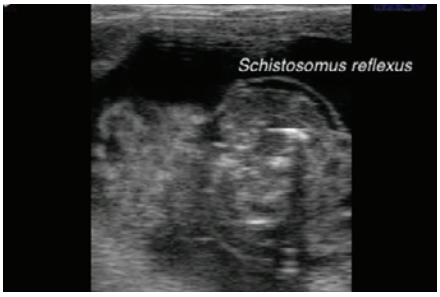


Fig. 6. Schistosomus reflexus.

Confirmation of gestation

The diagnosis of gestation carried out in an accurate and early way is a guarantee of efficiency. However, we must not limit ourselves to a single check, but at least two other gestation confirmations must be carried out. The reason for this choice apparently aimed at increasing operating costs, is instead to lower costs, identifying the cows that have lost gestation as soon as possible.

Between the 30th-60th day of gestation, on average 12-13% of single pregnancies are lost, while in the presence of twin gestations the pregnancy loss in this same period is 2-3 points higher, without distinction between mono or bilateral twin pregnancies. 80% of gestation losses between the first and second months of gestation are asymptomatic, i.e. the cow shows absolutely nothing that suggests the loss of gestation.

Considering that losing a gestation at 60 days of pregnancy costs the farmer about $600 on average, the importance of a second pregnancy check is immediately clear. This second check could be used to get other information as well:

- Confirmation of gestation.
- Carrying out foetal sexing.
- Confirmation or diagnosis of twin gestation.
- Early diagnosis of foetal malformation (Fig. 6).

The ultrasound confirmation of gestation at 60 days is rapid, taking only a few seconds, during which it is possible to highlight the foetus, verify its viability and the possible presence of foetal malformations, which, if found, will require the use of prostaglandin to terminate the gestation.

If there is a previous diagnosis of twinning, the presence of two foetuses must be confirmed during this second check-up. Sometimes, at the first gestation check-up, the second embryo escapes diagnosis.

During this second check, the foetus that escaped us 30 days earlier is now identified very easily and quickly, thanks to the twin line identification.

The diagnosis of twinning has great value: cows with twin pregnancy have an average gestation period of 7-10 days shorter than cows with single gestations. These cows will be put in dry off and then in close up, 7-10 days before the term, and it will always be necessary to give them assistance at calving.

Also, during this second check it is possible to carry out foetal sexing (Figs. 7-8).

The reliability of this determination is 99.99% if the sonographer is a master of the technique. This is a test that takes a few seconds and greatly increases the value of the second gestation diagnosis. The diagnosis of foetal sex is particularly useful in the case of a twin gestation at 30 days, not confirmed at the second checkup.

The presence of only one foetus means that the embryo/foetus is dead. In the event that the remaining foetus is a female, the risk that this could be a freemartin is very high, if the dead embryo/foetus was a male.

For this reason, once the diagnosis of a female foetus has been made, this gestation must be reported in the database, so that the management programme informs us when the female calf will be 30 days old, in order to be able to subject it to a blood sample, to establish whether she is a normal calf or a freemartin. In the latter case it will be possible to sell the calf, avoiding losing €1,000-1,200, discovering that she was a freemartin at 10-12 months of life.

In the presence of twin pregnancy, between 60-90 days of gestation, 8% of gestations are lost in the case of bilateral twins, and up to 32% in the presence of unilateral twins (Fig. 9). Most of these gestations are lost without external signs,, leading us to continue to think that they are pregnant, a third gestation check between 100-120 days pregnancy in the case of twin gestations is amply justified economically.

Whether it is single or twin gestations, a last gestation check carried out at 180 days of gestation or immediately before putting the cows in dry off is of great use to avoid drying cows that are no longer pregnant and perhaps treating them with intramammary antibiotics.

Conclusions

The diagnosis of pregnancy is essential, on any type of farm. An early pregnancy diagnosis is even more so. Ultrasonography allows us to make a very accurate diagnosis, that is not dangerous for dam and embryo, is fast, repeatable in any environment, and cheaper.

Considering the incidence of late embryonic death, early foetal death, the incidence of abortion, and, above all, in consideration of the fact that in most cases the loss of gestation is asymptomatic, the reconfirmation of gestation at 60-70 days, at 100-120 days (for twin pregnancies) and at 180-200 days of pregnancy, finds ample economic justification,.

During the first reconfirmation of gestation it is possible to carry out the diagnosis of foetal sex, confirm and/or realise the presence of a twin gestation, and also carry out the diagnosis of any foetal malformations. ■

References are available from the authors on request

Fig. 7. Male foetus.

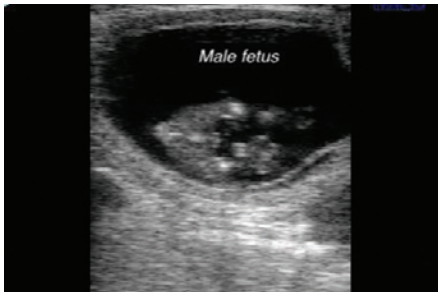


Fig. 8. Female foetus.

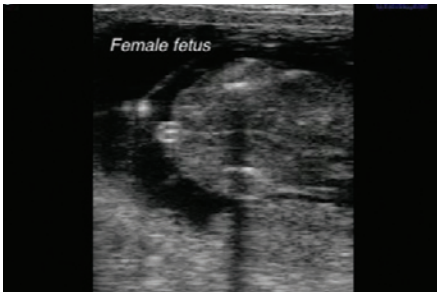


Fig. 9. Embryo death.