

Advanced and Accurate Pregnancy Diagnosis of an Inseminated Cow- A Case Report

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Abstract—Pregnancy diagnosis in large animals remains difficult and challenging. Early pregnancy diagnosis is important for feeding, housing, care and management of pregnant animals. It is also important for the separation of non-pregnant animals which require special care for further breeding. Modern commercial dairy farming systems employ several techniques to know the pregnancy status of cattle including rectal palpation, hormonal assays and ultrasonography. The main objective of this study is to identify the most suitable method for the diagnosis of the advance stage of pregnancy in cows, in terms of accuracy, easy application and cost-effectiveness.

Keywords— Pregnancy diagnosis, Pregnant, Non-pregnant, Cows, Ultrasonography.

I. INTRODUCTION

Early pregnancy diagnosis is essential for optimizing herd health, reproductive efficiency, and overall farm profitability in dairy and beef production systems. Pregnancy diagnosis is most important for the detection of non-pregnant cow which commonly known as “problem animals” and subsequently remove the causes and give them proper treatment and management for making them pregnant as soon as possible resulting improve the reproductive efficiency of the commercial dairy farm (1). Diagnosis of pregnancy in the advanced stage plays an important role in reducing the time for calving to conception known as day open, helps to maintain a normal post-partum period, and ultimately cows can produce one calf per year per cow (2). There several techniques are applied for the diagnosis of pregnancy in cows but it has some limitations in terms of sensitivity, specificity, accuracy, portability, speed, and easy of application. Rectal palpation and ultrasonography are the direct methods commonly used for early pregnancy diagnosis. Hormonal assays are the indirect method used to diagnose pregnancy in cows.

Our theriogenology group have already employed several techniques for the diagnosis of pregnancy in cow, horse, buffalo, sheep, goat, dog, cat, and rabbit. In this proposed study, we attempt to find out suitable methods for advanced and accurate pregnancy diagnosis in cow.

II. CASE PRESENTATION

We visited a commercial dairy farm in Chattogram for the diagnosis of pregnant and non-pregnant cows using an ultrasonography machine. A 5-year-old high-yielding variety (HYV) cross-breed cow was presented with the history of artificial insemination (AI) a few days ago. After successfully performing artificial insemination, there is no sign of heat or estrus after 21 days of post-AI. Then we check the record book for the confirmation of the time and date of AI. On

physical examination, body temperature, feeding, and other parameters are found to be normal. Finally, we perform a clinical examination by rectal palpation followed by ultrasonography for confirmatory diagnosis either advanced stage of pregnancy or non-pregnant.

III. RESULTS AND DISCUSSION

The easiest and simplest ways of early pregnancy diagnosis in cows are by taking the history for the presence of estrus signs after artificial insemination or natural breeding. There are no signs of estrus after 21 days of artificial insemination of the investigated cow. Similar types of findings were observed by the researchers (3) stated that no sign of estrus after 18 to 24 days of breeding, conception may be occurred. The absence of an oestrus sign does not confirm the diagnosis of pregnancy.

The most common, oldest, traditional, and widely used method for pregnancy diagnosis in large animals especially cows is rectal palpation. In rectal palpation, clinicians mainly depend on the palpation of the uterus for the early fetus and changes in the uterus due to the presence of the fetus. Rectal palpation revealed the presence of corpus luteum in the ovary. There are limited palpable structures found in the uterus due to advanced stages of the gestation period within 30 days after insemination. These results are consistent with findings from other researchers the least observable changes occur in the uterus at 30 days of the gestation period (4) as a result it is difficult to make early pregnancy diagnosis by rectal palpation at 30 days. On the other hand, pregnancy diagnosis by rectal palpation after 35 days may be possible with highly skilled and efficient persons, such as slipping of the chorio-allantoic membranes (5), and early fetus at 45 days of gestation (6). Sometimes improper rectal palpation may risk early embryonic death (7).

High progesterone levels in milk and serum of pregnant cows will be increased at 21-22 days after post-breeding (12ng/ml) but in non-pregnant cows, the level of progesterone

remains low (3ng/m) (2). Similar findings were observed in the cows we studied. Other researchers explained that the level of progesterone in milk ≥ 11 ng/ml, 8 to 11 ng/ml, and ≤ 8 ng/ml was differentiated as pregnant, questionable, and not pregnant (8). As a result, It is difficult to distinguish between pregnant and non-pregnant cows only based on progesterone level because progesterone is directly connected with the corpus luteum of the ovary. Any pathological disease conditions for the presence of corpus luteum may lead to misinterpretation.

We performed ultrasonography for the diagnosis of pregnancy in cows on a commercial dairy farm at 30 days of post-artificial insemination.



Figure 1: Using ultrasonography for the diagnosis of early pregnancy accurately.

Before going to applied ultrasonography, we took the history of these investigated cows. We took all types of hygienic measures and precautions for the insertion of rectal probes into the rectum. We thoroughly observed the horn and body of the uterus for the presence of the embryo at advanced stages on 30 days of post-artificial insemination precisely.



Figure 2: The presence of an embryo in the monitor of the ultrasonography machine at 30 days of pregnancy

The results of this study showed that the ultrasonography method was applied to examine the early embryo accurately at 30 days of gestation in a cow. Other researchers have reported similar results for early pregnancy diagnosis by ultrasonography from 28 to 30 days after breeding (7, 9, 10). The ultrasonography method is commonly known as the “Gold Standard” method for the diagnosis of pregnancy, which is widely and commonly used in humans and animals for routine check-ups of viable fetuses with their morphological structures.

In our experiments, We estimated the gestation period or pregnancy period from history and finally confirmed using a records book. But using ultrasonography, we can easily measure the age of gestations in animals by using the buttons on ultrasonography as (OB measure) obstetrical measurements. Firstly, focus on the full length of the early embryo on the monitor then freeze followed by measuring the Crown-Rump Length (CRL) for estimating the age of pregnancy and Expected Date of Delivery (EDD).

The measurement of CRL in our study was found to be 7mm or 0.7cm which means the gestational ages range from 4 to 5 weeks approximately matching the results of another research (11), which observed that the CRL at 4 weeks ranges from 6 mm to 11 mm and 5 weeks of ages ranges between 8mm to 19mm. CRL can be measured at the early period of gestation when the fetus size is less than 10cm (12,13).



Figure 3. Measurement of CRL for EDD

IV. CONCLUSION

The history of absence of estrus, presence of corpus luteum in the ovary, and level of progesterone could not diagnose early pregnancy accurately, but ultrasonography diagnosed it early, correctly, and accurately. The ultrasonography method in combination with the history of insemination, absence of estrus after 21 days of post-artificial insemination, and rectal palpation are promising and potential

methods for the advanced and accurate diagnosis of pregnancy in cows on a commercial dairy farm.

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