THE ACCURACY OF PREDICTING TWINS BY RECTAL PALPATION IN DAIRY COWS

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INTRODUCTION

Dairymen in the USA look upon twinning in dairy cows as an undesirable and unwanted event because of the strong association with abortions, stillbirths, dystocias, retained fetal membranes, uterine infections, infertility, increased culling and possible reduced milk production. The possible causes, associated factors and consequences of twinning have been reviewed.[1-4] Unfortunately, there is evidence that twinning in dairy cows is increasing.[5] Whether the adverse effects of twinning can be eliminated or reduced by improved feeding and management practices has not been substantiated. In order to apply such practices, there must be an accurate method to determine the presence of twins.

The objective of this study was to assess the accuracy of rectal palpation in predicting twins in 25 herds.

MATERIALS AND METHODS

Twenty-five dairy herds (21 Holstein, two Jersey, one Brown Swiss, and one Guernsey) were used to assess the accuracy of rectal palpation to diagnose twin pregnancies during a one year period (July 1, 1989 to June 30, 1990). The herds ranged from 40 to 300 cows and depending on size and location, visitations were made at two to eight week intervals with the majority occurring at four to six weeks. Only cows with breeding dates between 35 and 60 days at time of examination were used in the final results. In some herds visited at periods greater than four weeks, a significant number of pregnancies were greater than 60 days and not included.

During routine pregnancy examinations a special effort was made to determine the presence of twins. An attempt was made to palpate both uterine horns for the presence of one or two amniotic vesicles (AVs) and both ovaries to identify one or two corpora lutea (CLs). Prolonged examination time and excessive manipulation of the uterus were avoided. The diagnosis of twins was divided into positive or suspected. The identification of two AVs, either unicornual or bicornual, was a positive diagnosis. A suspected diagnosis of twins was made when only one or no AV could be identified, but two CLs on one or both ovaries were palpated.

All results were based on the birth of calves at term or observation of aborted fetuses. Two experienced clinicians made the examinations. There was no difference between examiners in their accuracy of predicting twins so the results were combined.

RESULTS

A total of 1,383 cows were diagnosed pregnant between 35-60 days after breeding. Of this group, there were 73 multiple births (72 sets of twins and one set of triplets). One twin birth resulted in

one normal calf and an amorphus globosus. This set and the set of triplets were suspected of carrying twins at pregnancy examination.

Of the 73 cows having multiple births, 47 (34 positive and 13 suspected) had been diagnosed as carrying twins and 26 a singleton; an accuracy rate of 64% for predicting twins. However, accuracy declined from 75% the first six months of the project to 56% the second six months. Apparently, as the year progressed, there was less concentration on the part of the examiners and examinations became more hurried.

Of 56 cows with a positive diagnosis of twin pregnancy, 47 had bicornual AVs and nine unicornual AVs. Eight cows (all bicornual AVs) lost both fetuses prior to term; eight cows (seven bicornual AVs and one unicornual) were culled from the herd for various reasons prior to term and 40 cows gave birth to term calves. Of the 40 cows giving birth, 32 with bicornual AVs gave birth to 27 sets of twins and five singletons; eight with unicornual AVs gave birth to seven sets of twins and one singleton. Therefore, six (15%) of the cows lost one of two fetuses prior to term.

Of 23 cows suspected of carrying twins (based on two CLs and one or no AV), 13 (56%) gave birth to twins and 10 (44%) had a singleton.

DISCUSSION

An effort was made to diagnose twin pregnancies by rectal palpation. There is no information available comparing the accuracy of identifying twins by palpation to the reported calving results. With the ultimate goal being to identify two AVs, bicornual AVs were less difficult to locate than unicornual AVs. The optimum time to diagnose twins is between 40 and 50 days after breeding which is in agreement with a large study on induction of twin pregnancy.[6] Reasons for failure to locate two AVs included: not taking sufficient time, excess fluid in the uterus, tenseness of the uterine wall and inability to position the uterus properly to perform a thorough examination of the uterine horns.

The loss of one fetus (six of 40;15%) or both (eight of 48;16.6%) is in close agreement with two studies in which twins were diagnosed only by identification of two AVs. In these studies the loss of one fetus occurred in 12.5%[6] and 15%[7] and the loss of both in 17.6%[7]. The early loss of one or both twins occurred at a greater frequency than single pregnancies.[6] The increased amount of handling of the uterus required to diagnose twins versus singles very likely contributed to the increased fetal losses,[6,7] and there was more fetal loss when two examinations of the uterus were required to establish the presence of twins.[6]

Of 56 sets of twins, 47 (84%) were bicornual and nine (16%) unicornual. This is very similar to a slaughter survey of 86% bicornual and 14% unicornual twins,[8] but unlike another slaughter survey of 41% bicornual and 59% unicornual twins.[9]

The partial or total loss of fetuses (one of eight unicornual twins and 13 of 40 bicornual twins) differs with a study in which there was a greater loss of unicornual twins,[6] and another, in which there was no difference.[10]

Predicting or suspecting twins by palpation of two CLs without identification of two AVs is less accurate. Of 23 cows in this group, 56% gave birth to twins and 44% singletons. Failure to locate AVs was common, likewise, errors in identification of multiple CLs also occurred. In a study comparing rectal palpation and

laparoscopic visualization as a means to identify CLs six to 10 days after insemination, palpation correctly identified two CLs 74.7% of the time. The major source of error was failure by palpation to detect a second CL; a less frequent error was mistaking a follicle for a CL.[11] It is possible that some cows suspected of carrying twins had two CLs, but one ovum was not fertilized, one zygote died or one embryo died prior to attaining palpable size, leaving only one viable AV.

Reducing the number of AVs by manual crushing has been reported in two studies. In a trial with twin AVs, crushing one resulted in the birth of a single calf in 46% of the cows and early loss of both 56% of the time.[7] When three or four AVs in 19 cows were reduced to two each by manual rupture, only two cows (one single, one twins) produced calves; all others aborted.[6]

To better manage and feed twin carrying cows, an accurate and safe method of identifying twins is needed. In the reported study, accuracy was less than desired. To achieve a higher accuracy rate, more prolonged and possibly excessive handling of the uterus would be required. The possible detrimental effects of such manipulation to survival of the pregnancy must be considered. As an alternative, ultrasonography is a very effective method of diagnosing twin pregnancies.[11,12] At the present time, however, expense and time required have made it impractical for routine use in cattle practice.

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SUMMARY

The prediction of twins by rectal palpation was carried out in 25 dairy herds during one year. Only cows between 35 and 60 days of gestation were included. All results were based on records of parturition or observed abortion. Seventy three of 1,383 cows gave birth to twins. Of the 73 twin births, 47 were diagnosed correctly and 26 were predicted to have a singleton. Palpation of two amniotic vesicles (AVs) was considered the positive criterion for predicting twins. Of 32 cows with bicornual AVs, 27 gave birth to twins and five a singleton. Of eight cows with two unicornual AVs, seven had twins and one a singleton. Prediction of twins by palpation of multiple CLs without identification of multiple AVs was less accurate. Of 23 cows in this group, 13 had twins and 10 a singleton.