animal sciences dairy
COOPERATIVE EXTENSION SERVICE, PURDUE UNIVERSITY, WEST LAFAYETTE, INDIANA 47907

AS-451-W

Reviewed 2001

Purdue University

Cooperative Extension Service

West Lafayette, IN 47907

Ovarian Cysts in Dairy Cattle

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Ovarian cysts reduce reproductive efficiency on almost every dairy farm in the United States. It has been estimated that the incidence of ovarian cysts ranges from 5 to 20 percent in most herds. A recent Wisconsin field study of dairy herds reported that the incidence of ovarian cysts ranged from a low of 16.2 to a high of 47.4 percent. Mature cows have a higher incidence (39 percent) of ovarian cysts than do first-calf heifers (11 percent). Breeding age heifers have a lower incidence of ovarian cysts (3-6 percent). It is interesting to note that beef cows have a relatively low incidence of cystic ovarian disease. Because ovarian cysts reduce reproductive efficiency, they are a source of severe economic loss in most dairy herds.

Description

Ovarian cysts (Figure 1) are follicular structures having a diameter of at least 2.5 centimeters (about 1 inch) that are present for 10 or more days on the ovaries in the absence of a functional corpus luteum (CL). The only practical method to detect cystic ovarian disease is by rectal palpation of the cow's reproductive tract. This fact emphasizes the importance of regularly scheduled herd health examinations of postpartum cows by a veterinarian skilled in rectal palpation. Ovarian cysts can be classified as either follicular cysts or luteinized follicular cysts. Table 1 lists the characteristics of follicular and luteinized follicular cysts. Cystic corpora lutea (CL with a fluid filled cavity) should not be confused with ovarian cysts because the former are not pathological and function normally both during the estrous cycle and pregnancy.

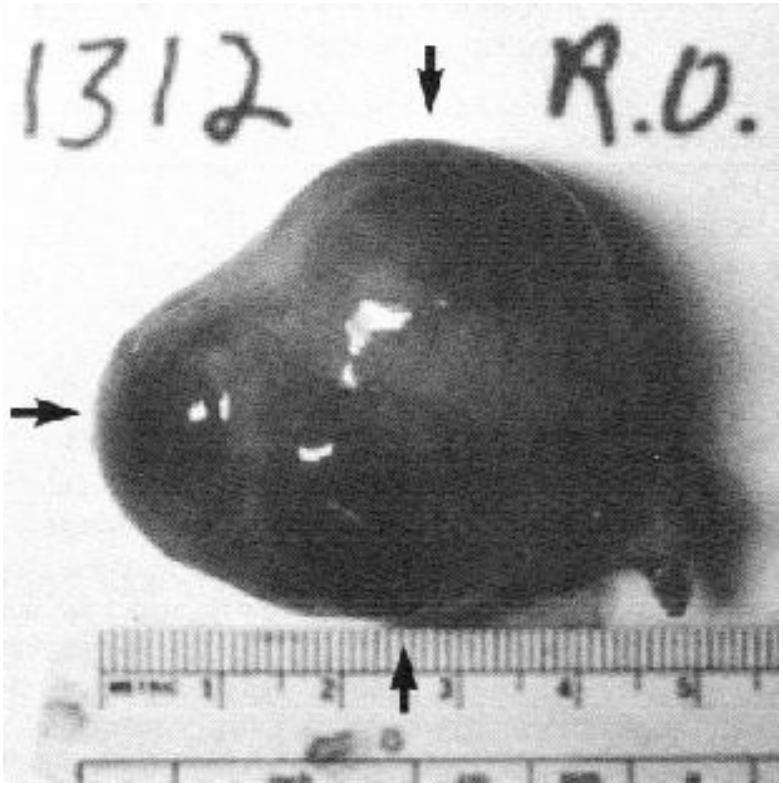

Figure 1. Ovary containing three follicular cysts (blister-like structures).

General Symptoms

Cows with ovarian cysts have an abnormal pattern of estrous behavior (see Table 1), and, in many cases, the absence of estrus (anestrus) is a common symptom of a cow with cystic ovarian disease. The physical appearance of cows with ovarian cysts is usually not different from that of other cows. However, the following are general symptoms that cows with ovarian cysts may have: 1) thick, cresty neck, 2) little or no muscle tone in the vulva, vagina and uterus, 3) relaxation of the sacroiliac and sacrosciatic ligaments, resulting in the appearance of an elevated tailhead and 4) abrupt changes in milk production. It should be noted that these general symptoms are useful only in a preliminary diagnosis of cystic ovarian disease and that rectal palpation is required for a definitive diagnosis.

Table 1. Characteristics of Follicular and Luteinized Follicular Cysts.

Parameter	Follicular Cysts	Luteinized Follicular Cysts
Structure	thin-walled, with thickened theca layer and variable amount of granulosa cells	thick-walled, with luteal tissue lining inside of follicle
Number of cysts and ovary	single or multiple on	usually single on one
distribution on ovaries	one or both ovaries	
Occurrence of cyst type	approximately 70% of cases	approximately 30% of the cases
Serum and milk pro - gesterone concentra- tions	usually low	usually high
Behavior of cows	anestrus (majority) or erratic estrus or nym- phomania	usually anestrus
Chance of recovery without treatment	30-70 % if occurrence is before first post- partum ovulation	same
	20-30 % if occurrence is after first post- partum ovulation	same
Recommended treat- ment	100 ug GnRH (may be followed 9 days later by one dose of a prostaglandin [PG] product)	same
Days to estrus after treatment	21 days without PG (range 9-30 days)	same
	approximately 12 days with a PG product	same
Response to treat - ment	60-70%	70-80%
Conception rate at	45-60%	same

first estrus after treat -
ment

Etiology (Causes)

The exact factors that are responsible for cyst formation are unknown. However, most researchers believe that a malfunction in the preovulatory release of luteinizing hormone (LH) is responsible. When cysts develop, follicles enlarge to an abnormal size instead of ovulating and releasing an egg (Figure 2). The presence of cysts prevents the cow from having normal 21 day estrous cycles. Therefore, the cow cannot be bred, and pregnancy will be delayed until the cyst(s) regresses spontaneously or responds to treatment.

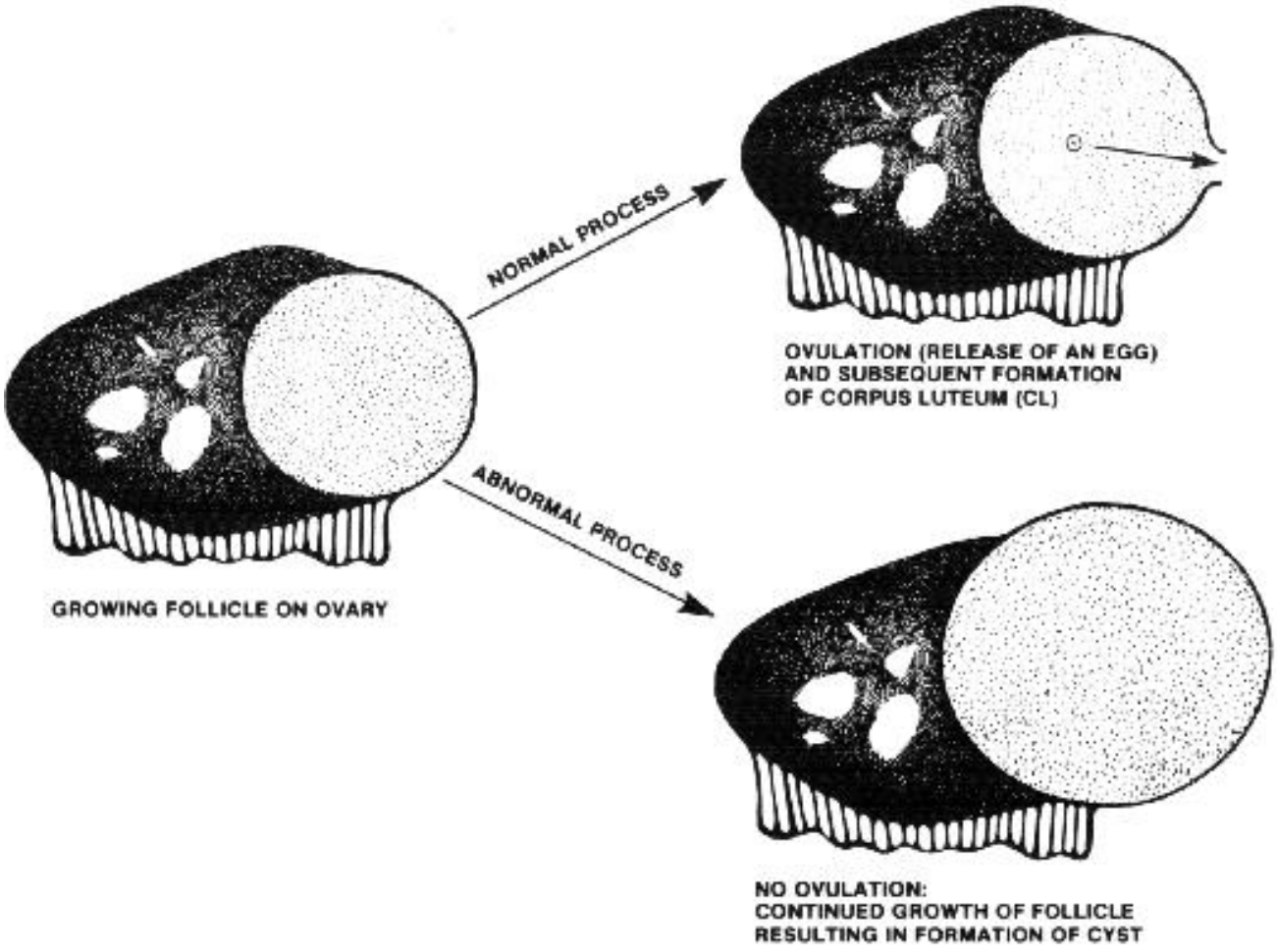

Figure 2. Cyst formation is caused by an abnormal process

Genetic Influences

In a Swedish study, Al sires were culled if their daughters had ovarian cysts. Over a 20-year period (1954-1974) the national incidence of cysts in Sweden declined from 10 to 3 percent. This decline in the incidence of ovarian cysts implicates genetics as having a major role in the transmission of cystic ovarian disease from one generation to the next. Therefore, culling cows and heifers with ovarian cysts would appear to be one method

of permanently decreasing the occurrence of ovarian cysts in dairy herds. Unfortunately, many cystic cows are also the high producers, making effective culling difficult to implement in many cases.

Nutrition Influences

To date, comprehensive studies have not demonstrated a link between nutrition and ovarian cysts in dairy cattle when experiments were conducted with properly balanced rations. In other words, if the ration meets all of the nutrient requirements of the cow, additional amounts of selected nutrients (i.e., Beta-carotene and selenium) will not revent ovarian cysts. However, it is of utmost importance that rations be properly balanced and provided in adequate amounts to meet the requirements of milking cows.

Production Influences

Although it is a common belief that high producers may be more prone to develop ovarian cysts, no experimental data supports this contention. Increased milk production may be a result of the altered hormone environment that occurs with ovarian cysts rather than a cause of ovarian cysts.

Treatments

In the early part of this century, manual rupture (via rectal palpation) was used as a treatment for ovarian cysts. Recovery rates were approximately 45 percent. However, because of possible hemorrhaging, formation of adhesions around the ovary and the advent of hormonal treatments, manual rupture is used less frequently than in the past. More recently, hormones having high LH - like activity have been successfully used as a treatment for ovarian cysts. Initially, pregnant mare's serum gonadotropin (PMSG) and human chronic gonadotropin (hCG) were utilized, but, due to their large molecular weight, some cows developed antibodies against these products and retreatments were not always successful. However, hCG is still a commonly used treatment for ovarian cysts.

Currently, gonadotropin releasing hormone (GnRH) is the most frequently recommended treatment for cows with ovarian cysts because it causes the pituitary to release LH and does not result in antibody formation. Table 1 lists the treatments for follicular and luteinized follicular cysts and describes the expected outcome after treatment. Because a high proportion of cysts spontaneously regress during the early postpar tum period, treatments are usually not administered until after 30 days postpartum. The GnRH treatment causes luteinization of the cyst, and the subsequent prostaglandin treatment of the luteinized cyst causes regression of that structure.

Summary

1. Ovarian cysts reduce reproductive efficiency in most dairy herds.

2. Rectal palpation is the only practical method to detect ovarian cysts.

3. The exact cause of ovarian cysts is unknown.

4. Culling cows and heifers that have had ovarian cysts can permanently decrease the incidence of ovarian cysts in most dairy herds.

5. An injection of GnRH is an effective treatment for ovarian cysts.

RR 4/91

Reviewed 2001

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