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Gynecology and Obstetrics in the Goat

by
Jens Engum* and Olav Lyngset†

The goat is one of the most fertile species among our domestic animals. Usually there are no problems with the matings and the conception rate is very high, 96–98% (Lyngset 1966). Birth and delivery are simple events in the goat and usually no problems arise. Now and then, however, the goat is in need of obstetrical help and in such instances it is often found that the problem is greater than in cases with sheep.

It is an unfortunate trend that in all of the textbooks on Veterinary Obstetrics, the small ruminants are described as a single entity (Roberts 1956, Richter & Götze 1960, Wright's 1964). There are, however, obvious disparities between these two species which indicate that obstetrical methods and techniques are not interchangeable. There is therefore a need for a survey of obstetrics in the goat.

In the present paper a survey is given of some normal aspects of gynecology and some gynecological and obstetrical disorders in the goat. The content is based on a review of the literature and on own investigation and personal experience. Emphasis is laid on aspects which differ from those where sheep are involved.

Gynecology

Very few methods of diagnostic values

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are available for gynecological examination in the small ruminants. Palpation and the use of a vaginal speculum are the only methods in use. The use of a peritoneoscope for examination of the internal genital organs is not adapted for routine practice.

With the speculum the vagina and vaginal part (Portio) of cervix can be inspected. In order to recognize what is pathological it is of great significance to be familiar with the normal findings during the sexual cycle, oestrus and pregnancy.

In an effort to acquire a knowledge of the vaginal picture and its variation, 24 animals were examined daily during oestrus, dioestrus and early pregnancy.

The initiation of oestrus is followed by a hyperemia in the cervix and vaginal wall. The cervix becomes oedematous, increases in size and the cervical canal extends. The size and the shape of the cervix are subject to great individual variations.

The cervical secretion, at first sparse and watery in appearance increases in amount in the course of 24 hours, and becomes more viscous and less transparent. The secretion accumulates in the bottom of the vagina and finally becomes cheese-like in consistency and white to greyish in colour. At the end of the oestrous period all these changes in the cervical secretion can be seen. According to Bonfert & Thier (1963) the best time for insemination is when the secretion is cheesy and greyish.

At the same time the cervical canal is maximally extended.

After oestrus the hyperemia disappears as does the cervical mucus.

In the diostrus period the vaginal wall is pink and the cervix is contracted and white in colour. This picture changes and the cervix opens slightly and there is a small secretion of mucus followed by a closure of the cervical opening.

During pregnancy the cervix is closed and white in color and no cervical opening can be seen. The cervix is plugged by tough mucus, yellowish-brown in color (Lyngset 1968a).

Every now and then the goats show signs of oestrus during pregnancy. This heat period is not followed by the normal changes in the Vaginal picture. Neither is there any ovulation, during this heat period according to *Germann* (1963).

Hermaphroditism is the most important cause of sterility in the goat. Besides ovarian cysts it is the only condition of significance as far as the reduction of fertility is concerned (Lyngset 1968b)

In the goat, the incidence of hermaphroditism has been very high in many breeds. *Eaton & Simmons* (1939) report 11.1% intersex in the Saanen breed and 6.0% in the Toggenburger breed. *Kondo* (1959-53) found an average of 4.3% intersex in Japanese breeds from different areas.

In Norway in 1960, *Haugen* found 234 or 5% hermaphrodites among 4,656 kids. The incidence of the hermaphroditic condition in the Norwegian goat breed seems to have decreased since the investigation of *Haugen*.

In two previous investigations (Lyngset 1966 and 1968c) a frequency of 1% and 1.7% hermaphrodites respectively was found by inspection of the external genital organs. As will be shown later about 1/3 of the hermaphroditic goats can not be diagnosed by inspection. It can be stated that the distribution of the hermaphroditic condition among the Norwegian goat breed is about 2%.

Kondo (1952-53) divided the intersexual grades according to anatomical differences of the external genitalia into five classes.

1. Female type,
2. Semi-female type,
3. Intermediate type,
4. Semi-male type,
5. Male type.

Of these types the female and semi-female type have an external genital apparatus which resembles that of the normal female goat except for a varying degree of hypertrophy of the clitoris in the semi-female type.

It is of clinical interest to be able to eradicate the hermaphroditic kids as soon as possible after birth. For the female and semi-female type this is impossible. In the investigation of *Kondo* the female and semi-female type amounted to 38% of the total number of hermaphrodites. In an investigation of a total of 480 kids, 7 or 1.46% were hermaphrodites with external genitalia which made the diagnoses obvious at birth. Later on it became evident that 4 kids were hermaphroditic with normal female external genitalia, although two of them had a hypertrophy of clitoris.

It can be postulated that 2/3 of hermaphrodites could easily be eradicated at birth. The remaining 1/3 can be diagnosed first at sexual maturity and some of these are impossible to diagnose clinically.

Obstetrics

The incidence of cases requiring obstetrical help is low in the goat. According to information collected from the breeders there is need for some kind of help in about 3-5% of the births. This percentage is low compared with findings in some of the Norwegian sheep breeds (*Aamdal & Lyngset* 1970).

In both goats and sheep many of the obstetrical problems are tackled by the breeders themselves. When a veterinary surgeon is needed there are disparities in the methods of treating an obstetrical case in the sheep and the goat. This variation in treatment is necessitated by the following circumstances among other things:

1. As previously mentioned, birth complications, when they appear in the goat, can be very difficult to treat. The uterus and the vagina are fragile and are easily ruptured even when the greatest care is

exercised. The possibility of performing a manual dilatation of the entire birth canal is markedly reduced because of lack of space.

2. The cervical canal appears to remain dilated for a much shorter period in the goat than in the sheep. The foetus should be delivered quite rapidly, in the course of 2-3 hours, otherwise the cervix contracts and complicates the extraction of the foetus.

3. In the goat there are usually too many kids born, therefore the foetus itself is of no economic importance. The primary aim should therefore be to save the life of the goat and thereby the milk production.

Most of the kids are born in an anterior, longitudinal presentation. Among 372 kids born, *Lange* (1939) found only 34 or 9.1% in a posterior, longitudinal presentation. Out of a total of 159 kids born in two goat-herds under control only 5 or 3.1% were in a posterior presentation. All of these kids were twins. In three cases the second kid, in one case both kids of a pair of twins were born in a posterior presentation. Of the 49 single kids born all were in an anterior longitudinal presentation.

In a material, collected from colleagues in practice, comprising about one hundred goats needing obstetrical help, the ratio between posterior and anterior presentation in these goats was greater, than in the total goat population. Although not mentioned by him, this can also be concluded from the figures of *Wyssmann* (1945). It can be postulated that the posterior presentation in the goat per se predisposes to dystocias and obstetrical disorders.

The indications for obstetrical help in the goat can be grossly divided into two.

1. When the foetus or foetuses are retained in the uterus.

2. When the foetus is obstructed in the birth canal.

1. When the foetus or foetuses are retained in the uterus.

The causes for this can be various forms of dystocia with a deviation from the normal in presentation, position and posture.

If there is space enough there is little problem with the correction of a malpresentation. A common maternal dystocial form in the goat, however, is a deficient dilatation of the cervical canal. A manual dilatation is, however, usually ineffective, and the possibilities of a uterine rupture are imminent. Therefore the indications for a cesarean section in the goat are numerous. Cesarean section should be recommended in the goat in all cases instead of manual obstetrical methods with violent distention of the cervical canal and traction on the foetus. If the section is performed on time and there is no rupture anywhere in the birth canal, the prognosis is good. Cesarean section can be performed in many ways, on standing and recumbent animals, and with different techniques. One of these methods, preferred by us and adapted for use in practice, is described below.

Combelen,¹ about 2 ml i.m. and about 30 ml 1% Xylocain as a local infiltration are used for anesthesia. This combination has proven to be a satisfactory form of anesthesia which prevents abdominal pressure. The goat is positioned on her right side on a ladder which is fixed at a suitable height and at an angle of 15-20 degrees. She is placed with her head downwards and her hind feet stretched backwards.

A ladder is very suitable as an "operating table." The main advantage being that an assistant can rotate the ladder so that the uterus and the foetus can be extracted horizontally out of the operation wound.

The incision is made vertically in the left flank. The hand is inserted into the wound and the tip of the uterine horn is palpated, thereafter, by rotating the table slightly the uterus can be easily exposed. In the cases with more than one foetus an incision is made in each uterine horn. This differs from the procedure recommended by *Germann* (1963).

If not infected, the placenta should not be touched, but as a prophylactic measure several antibiotic uteritories should be placed in the uterine cavity. The uterus and peritoneum are sutured with catgut and the muscles and skin with metal

1. Tranquillizer, Beyer

thread. A bandage is fixed to the sutured wound. An injection of an antibiotic is given prophylactically. Beyond this no post-operative treatment is necessary (This is of particular interest as it indicates the development in veterinary medicine since the report of *Wyssmann* [1946], who because of the bad results, could not recommend cesarian section in the goat.)

2. When the foetus is obstructed in the birth canal

There are cases when the foetus is wedged so tightly in the birth canal that it can not be extracted or retracted without danger to the goat. The causes can be a too large foetus, a narrow pelvis, emphysematous foetuses or malformations. In the goat a fracture of the tail bone resulting in ankylosis and malposition of the tail is frequently found as a cause of birth problems.

In all of these cases it is of value to try artificial foetal fluid, but very often the only way is to minimize the volume of the foetus before extraction.

A percutaneous embryotomy in the goat can not be performed. Even a little penknife should not be used in the birth canal without the greatest care. A subcutaneous embryotomy, however, can be advantageous. As mentioned previously the number of kids born is high, and an embryotomy is preferable to violent traction which can harm the goat.

After making an incision circumscribing the carpus of the foetus and extending as far as possible on the medial side of the leg, a front leg can be extracted. The connection between scapula and thorax is easily torn off. The thorax can be compressed by cutting the skin around the neck of the foetus and fracturing the ribs subcutaneously with the hand.

After extraction of the two anterior extremities and compression of thorax the whole columna can be rotated. When rotated the columna will fall apart at its weakest joint which is caudal on the lumbar part of columna. The whole columna can now be extracted and afterwards the hind feet can be pulled out. A complete

subcutaneous embryotomy is, however, seldom necessary.

The advantages of subcutaneous embryotomy are:

1. During the entire operation the skin of the foetus covers the birth canal protecting it against injury.

2. There is practically no need for using instruments in the birth canal.

Of the possible post-puerperal complications only retained placenta and prolapse of the uterus will be discussed.

Retained placenta occurs less frequently in the goat than for instance in the cow. *Richter & Götze* (1960) suggest that the reason for this is a lower frequency of placental infection.

Malnutrition, and in older animals osteomalacia are named as causes for retained placenta in addition to an infection of the placenta.

A mild infection with retention of placenta for only a couple of days is of no significance and causes no disturbance of the puerperium.

The treatment of retained placenta is systemic with antibiotics or chemotherapeutics perhaps combined with an irrigation of the vagina and uterus with a disinfectant. Manual treatment should be limited to occasional gentle traction on the hanging portion of the membranes (*Roberts* 1956). Because of the rapid closure of the cervix and the danger of rupturing violent traction should be avoided.

Prolapse of the uterus seems to occur less frequently in herds where the goats are kept in barns without separate stalls than in herds where the goats are kept in stalls. This observation has been made by many colleagues.

The prognosis is good even if the uterus has been prolapsed for 24 hours. Rupture of blood vessels and haemorrhage is not very common.

Before treatment the prolapse should be thoroughly washed with water and a disinfectant. The hind quarters of the goat are then elevated with the hindlegs broad apart. When repositioning the prolapse it is advisable to cover it with a towel to prevent perforations with the fingers. It is essential that the prolapse is corrected to

the very tip of the uterine horn. If not a residue may easily occur.

Prophylactically antibiotics are put into the uterus, and the vulva is sutured with gauze. The sutures are removed after a week.

If the prolapse is older than 24–36 hours or if the uterus is damaged the only treatment is to amputate the uterus. In this operation two things should be emphasized: The ligature must be tight, and a fixation should be placed cranially to the ligature when cutting off the prolapse. Should the cranial end disappear into the vagina and the ligature slip it will be almost impossible to get hold of it.

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Summary

1. A survey is given of some gynecological and obstetrical aspects of the goat.
2. The normal vaginal picture during oestrus, dioestrus and early pregnancy is discussed.

3. Of the hermaphroditic goats about $\frac{1}{3}$ have external genital organs which resemble those of the normal goat except for a hypertrophy of the clitoris in some cases.
4. Some obstetrical problems in the goat are discussed.
5. A technique for cesarian section adapted for practice is described.
6. Retained placenta and prolapse of the uterus are discussed.

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Omega Tau Sigma

Omega Tau Sigma, Iowa State University's professional veterinary fraternity started the 1970 academic year by pledging 15 new members from the freshman class. Three faculty members have been initiated into the fraternity as associate members. They are Dr. Dan Hillmann, Dr. David Graham, and Dr. Tony Prickett.

The newly elected officers who shall lead the fraternity for the coming year are as follows: President, Tom Johnson; Vice-President, Jim Taylor; Secretary, Larry Bean; Treasurer, Lou Hein; Treasurer-elect, Jerry DenHerder; Pledge Trainer, Bob Stout; Historian, Dennis Downs; Sergeant-of-arms, Harold McCaslin; and Faculty Advisors, Dr. Bruce Hull and Dr. George Baker.

The first social event of the year was the annual faculty barbecue. All members of

the veterinary faculty were invited, and the large number in attendance seemed to greatly enjoy the barbecued chicken, the relaxed atmosphere, and the opportunity to visit with students in a non-classroom situation.

OTS is continuing its Friday-noon-seminar series. Senior members presented seminars entitled: "Preconditioning Program in Iowa," "Diabetes Mellitus in the Dog," "Radiographic Diagnoses in Small Animals," and "Procedures for Diagnosis of Intervertebral Disc Syndrome in the Dog."

On Saturday, October 24, members of the fraternity traveled to Des Moines to take part in a service project. This consisted of unpacking trailers and boxes for Goodwill Industries, a charity corporation located in Des Moines.