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The Treatment of Infertility in Cattle

W. J. Gibbons, D.V.M., M.S.

The problem of infertility in cattle is one that the veterinary profession is far from solving. Research on the problem has been intensified during the last 10 years, but as yet the basic factors involved in the problem of the repeat breeding cow are still puzzling or unknown. Heredity may rarely play a part, but it does not explain the average infertile cow. Great stress is placed on the role of nutrition in reproduction, but infertility is greatest among the better class of cattle on the best of diets. No research worker has been able to pinpoint a vitamin or mineral deficiency existing as a cause unless the animals were suffering from a clinical deficiency disease. The young, undersized, underfed heifer will usually become "overbred" if exposed. Birth rates in the human race always rise in famine times and are high in countries with the lowest standard of living. When infection is considered we do know that specific infections as brucellosis, trichomoniasis, epivaginitis, and vibriosis are involved in breeding difficulties in many herds. The constant percentage of repeat breedings in other herds cannot be accounted for on the basis of specific infections. Non-specific infections are frequently mentioned. Culture of the cervical mucus of repeat breeding cows reveals a wide variety of pathogenic and non-pathogenic organisms. Many infertile cows are sterile to bacteriological culture. Efforts to infect the uteri of cattle with organisms isolated from the genital tracts of non-breeding cows are so unsuccessful that one almost loses faith in the germ theory of disease. Failure or imbalance of endocrine functions does play a role and we can treat for anestrus and cystic ovaries, but what happens to the cow that has a normal heat cycle; the egg is fertilized, but there is early death of the ovum or embryo? With the amount of research now going on concerning the problem we should know some of the answers in the near future.

After what I have just said, it may seem strange that I presume to talk on the treatment of a condition about which many causative factors are still unknown. Treatment of cattle infertility should be preceded by a careful consideration of history including calving date, calving diseases, heat dates and breeding dates, followed by external or general examination, vulval examination, vaginal examination and rectal examination. Careful examination will reveal that the majority of non-breeding cattle have some lesion or condition which can be ascertained or suspected. However, there is a good percent-

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age of repeat breeding cattle in which no gross pathology can be found even if post-mortem examination is included.

After a thorough examination of the infertile cow, the patient can be placed in one of three classifications: (1) functional sterility; (2) pathological sterility; (3) unknown etiology without lesions. Functional infertility includes anestrus, cystic ovaries, and possible delayed or absent ovulation. Anestrus is one of the most frequent causes of delay in breeding. The rate of anestrus is dependent upon management, especially in connection with observation of cattle. Anestrus occurring post-partum amounts to 10 to 15 percent. In cows checked for pregnancy usually 7 to 8 percent are found non-pregnant and anestrus. Newer types of estrogens which include alpha-estradiol and beta-estradiol should produce estrum in 85 to 90 percent of animals treated. Estrogens most commonly injected are estradiol-cyclo-pentylate, 4 mg. intramuscularly, and 1 cc. of stilbestrogen (25 mg. diethylstilbestrol with 10,000 units alpha-estradiol di-propionate). When treated early, cystic ovaries respond to an intramuscular injection of 5,000 to 10,000 units of chorionic gonadotrophic hormone. Some authorities believe the results are a little better if the hormone is injected directly into the ovary through the walls of the vagina. In the treatment of suspected delayed or absent ovulation, various treatments have been advocated. A small dose of chorionic gonadotrophic hormone, or 150 mg. of progesterone have been injected early in estrus and the cow bred 4 to 6 hours later. The results have been inconclusive.

Infertile cattle classified as pathological are those showing (a) specific infections, or (b) organic lesions. Specific infections include brucellosis, trichomoniasis, vibrio-sis, and leptospirosis. It would be impractical to discuss the handling of these conditions in a presentation of this type. Lesions found on clinical examination of infertile cows are congenital defects, vaginitis, cervicitis, endometritis, ovarianitis, salpingitis, chronic metritis, pyometra, and mumified fetus. Heifers showing congenital defects such as infantile organs, hypoplasia of ovaries, incomplete uterus, double cervix, and neuters and free-martann heifers should be sent to slaughter. Even when there is a possibility of conception, the genetic implications should be sufficient for the ethical veterinarian to condemn the animal.

The importance of vaginitis as a cause of infertility has promoted a difference of opinion in veterinary and artificial insemination circles. The opinion of those believing that vaginitis is relatively unimportant is based principally on observations regarding granular venereal disease. Granular venereal disease is so universal and so frequently seen in pregnant animals that veterinarians and others examining the genital organs of cattle may conclude that it does not deserve too much consideration as a cause of delayed breeding. When granular vaginitis is severe and accompanied by purulent exudation, there usually exists an anterior vaginitis with cervicitis which interferes with fertility. In well-marked granular vaginitis the conception rate may be 10 percent lower. There are also other forms of vaginitis that require treatment to insure good conception. In the treatment of types of vaginitis associated with infertility the insufflation of antiseptic powders into the vagina has proved superior to other methods. Best results have been obtained with the use of thiourea-silver hydrochloride complex salt, 1 percent silver picrate. Terramycin bolets placed in the cervical region are beneficial in some cases. Many practitioners use Nolvasan-S (chlorhexidine) with excellent results. In heifers and cows with delayed breeding and where vaginitis appeared to be the only lesion, treatment resulted in 80 percent or more breeding on the first subsequent service.

In non-breeding cows cervicitis is a frequent lesion. Clinically, there can be distinguished three grades of cervicitis. The mildest form is frequently associated with vaginitis but may exist as an independent lesion. Pathology is confined to the region of the external os. The folds of the external os show congestion, edema, and streaked hemorrhages of the folds are fre-
quent. The cervical opening is usually di-
lated with the first annular ring protrud-
ing as a dark red or purplish-red mass.
Rectal palpation will reveal the body and
internal portion of the cervix to be of nor-
mal size and consistency. A more serious
form of cervicitis will show more marked
congestion of the cervical folds and greater
protrusion of the annular rings. The en-
tire cervix feels swollen on rectal examin-
ation. Endometritis is a basic lesion in
most of these cases. The most serious and
usually incurable form of cervicitis is the
chronic indurated cervix associated with
chronic metritis. Mild forms of cervicitis
respond to treatment of the accompanying
vaginitis with insufflation of silver picrate
powder. When inflammation extends to
the body of the cervix swabbing with 5
percent silver nitrate or with iodine pre-
parations is indicated. A favorite iodine
mixture consists of: menthol crystals, ½
oz.; tincture of iodine, 8 oz.; glycerin, 8
oz. In cervicitis when endometritis is evi-
dent or suspected the uterus should be
infused with antibiotics. In most cases it
is advisable. In chronic cervicitis a poor
prognosis should be given. As chronic
cervicitis is usually a part of a chronic
metritis the uterus should be treated.
Many cases of chronic metritis are anes-
trus and the use of estrogens to promote
estrus and possible resolution is indicated.
Recommended treatments are swabbing
the canal of the cervix with iodine solu-
tion and infiltrating the uterus with anti-
biotics.

The basis of treatment of repeat breed-
ing cows in the absence of other lesions is
the treatment for apparent or suspected
endometritis. In a study of the uterus of
repeat breeding cows made many years
ago, the author found a desquamating en-
dometritis accompanied by streptococcus
or staphylococcus infection to be a promi-
inent cause. Recent research still in pro-
gress seems to give a negative side to this
theory. The relation of pathogenic bac-
teria to the rate of conception and to re-
peat breeding is not conclusive. Sections
of the uterus of infertile cows fail to show
endometritis as a common lesion. In the
treatment of the uterus by infusion with
antibiotics, the results seem to be favor-
able. Antibiotics placed in the uterus a
few days before breeding or a few hours
after breeding probably overcome any in-
festation present but possibly also have a
stimulating and regenerative effect on the
uterine mucosa to prepare it for the ad-
vent of the fertilized egg. Clinical trials
have been made on the use of penicillin,
dihydrostreptomycin, tetracycline and
chloromycetin. The best results have been
obtained by the use of 200,000 units of
aqueous crystalline penicillin combined
with ½ gm. to 1 gm. of dihydrostreptomycin.
When antibiotic infusions failed,
some cattle have conceived after the use
of the old Albrechtsen treatment of douch-
ing the uterus with 1 percent Lugol's so-
lution. In infusing the uterus, the Folmer-
Nilson or the Lukens catheters have been
used to the best advantage.

Most cases of incurable infertility are
included in the group of those having
chronic metritis, pyometra, ovaritis, and
ovaritis and salpingitis. Cows with bilat-
eral ovaritis and with bilateral ovaritis
and salpingitis should be salvaged. Cows
with unilateral ovaritis and salpingitis
rarely breed from the other side. In the
author's experience unilateral ovariec-
tomy has never been successful. Very few
cases with chronic purulent metritis ever
breed. Induction of heat, 2 percent Lugol's
solution irrigation and the use of antibi-
otics are indicated, but a poor prognosis
should be rendered. The prognosis in pyo-
metra, if the condition is not long-stand-
ing, is more promising. The uterus can
usually only be successfully evacuated by
the induction of estrum. Following heat,
mild chlorine irrigations and the infusion
of antibiotics may return the uterus to
normal.

In the preliminary remarks, the prob-
lem of infertility as to etiology was re-
viewed. Until the causes are more clearly
defined much of our treatment must be
symptomatic. In the use of the treatments
recommended above, the author has had
fair success, but much is still to be desired
in the application of diagnosis and treat-
ment to cattle with repeat breeding cycles.

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