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Reproduction in Water Buffalo (Part II)

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Diseases and Reproductive Disorders

Heat Stress: Because they have, dark skin, sparse hair, and fewer sweat glands than cattle, Water buffalo are much more prone to heat stress. High temperatures can cause anesterus in Water buffalo cows and infertility and loss of libido in bulls. Provisions must be made for cooling water buffalo during the hot season. Left to themselves, water buffalo wallow in mud or water. However, wallowing is not a necessity and sprinklers or buckets of water are effective methods of keeping buffalo comfortable.

Malnutrition: In most areas where water buffalo are kept, access to concentrated feeds is limited. Water buffalo are generally fed a ration of straw (wheat, oat, rice) and bran (wheat, oat, rice). While they are more capable than cattle of surviving and performing adequately on this, optimal levels of health and productivity cannot be expected. Feeding water buffalo improved rations results in earlier puberty, greater mature body weight, improved reproductive and milk production ability.

Sub-Active Ovaries: This is the major cause of infertility on Asian buffalo. A combination of hereditary, nutritional, seasonal and managerial factors contributes to this condition. A diagnosis is made based on rectal palpation of very small ovaries with no functional structures palpable. Do not rely on the absence of observed behavioral estrus for diagnosis. As noted above, signs of estrus are minimal in water buffalo and most mating occurs at night. A lack of observed estrus may simply indicate that the buffalo was not just seen in estrus or is pregnant. Village buffalo are often kept tied in a barn and have minimal opportunities to demonstrate lesbian riding behavior.

Treatment of sub-active ovaries includes improving nutrition, treating existing parasite infestations (especially flukes), treating mineral deficiencies, and just waiting. Onset of estrus often coincides with the rainy season and buffalo typically come into estrus 1-2 months after the start of the rainy season. Progesterone implants followed by PMSG

injections have been reported to be helpful in some cases.

Ovarian Pathology: In slaughter house studies on the ovaries of Water buffalo cysts, persistent CL, and encapsulation of ovaries are common observations. Saplingitis has been reported in buffalo at much higher rates than in cattle, though the reason for this remains unknown. However, it is important to take into account that these studies are usually based on old buffalo which are no longer functional. A female buffalo which is well fed and cared for has a functional lifespan of up to 30-35 years which is much longer than a cow or ox. And individual buffalo have been known to live up to 50 years of age.

Cervical and Uterine Abnormalities: Cervicitis, metritis, pyometra and vaginitis have all been observed in slaughter house studies at rates similar to those seen in cattle.
Diagnostic methods and treatment would be the same as those used in cattle. Remember that estrus mucus is clear at the beginning of estrus but turns cloudy in late estrus. This is different than in cattle whose mucus is clear throughout estrus but, is similar to what is seen in goats.

A high percentage of buffalo in AI programs have lesions associated with pipetting accidents. This is a result of inadequate restraint facilities for animals that are highly resistant to having anything put onside their vagina or rectum.

Abortions and Dystocias: Rates and causes of abortions, dystocias and retained placentas are all similar to those seen in cattle. Dydtocias are rare and are usually from postural abnormalities including deviation of the head and flexion of the front legs. Primiparous swamp buffalo bred to river buffalo tend to have large calves and require assistance. Early embryonic death rates may be higher in hot environments when buffalo are not allowed shade, wallowing, or sprinklers due to the susceptibility of buffalo to heat stress.

Teat Trauma: Buffalo are excellent swimmers. In Brazil they are able to swim across the Amazon River.

This can be a problem as many rivers are infested with piranha. In a herd of 100 buffalo in Venezuela, 40 had lost all or part of a teat due to piranha bites.

Suckling: Suckling a calf has a greater effect on inhibiting estrus in water buffalo than it does on cattle. Early weaning of calves results in a shorter time to first estrus. This is more of a problem in swamp buffalo than in River buffalo due to the difference in management. Milking a cow does not inhibit estrus nearly as much as suckling a calf. Just as it does in cattle, removing the calf for 48-72 hours results in a quicker return to estrus in buffalo

Infectious Diseases

General: In general, buffalo are amazingly healthy in spite of their often challenging living environment. Remember that these animals spend 5 hour a day wallowing in what amounts to sewer water. In the wild, buffalo prefer to drink from clean water sources, wallow in separate water and defecate and urinate in a third water source. Chinese workers have even toilet trained buffalo to defecate in specific sites to minimize the contamination of waterways with Schistosoma eggs. And, while buffalo housed with cattle will have fewer health problems in general they are

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susceptible to all of the same diseases that cause illness in cattle.

Mortality of calves is high, often because milk from buffalo is sold and the calf is fed a poor quality diet. Calves also occasionally drown when the adult rolls over them in a wallow. Calves are commonly infected with Toxocara vitulorum by ingesting colostrums or milk. This is the most common cause of death in buffalo calves in Bangladesh. Treatment of the buffalo cow prior to calving or treatment of the calf during the first days of life with a variety of anthelmentics is effective for prevention and treatment. Behaviorally, buffalo dams will readily adopt orphan calves and will allow several calved to nurse them simultaneously.

Hemorrhagic septicemia (Pasturella multocida is the most serious disease of buffalo. They are more susceptible to it than cattle. Affected buffalo get hot, hard painful swellings of the ventrial neck region. The tongue is swollen and mucous membranes are hyperemic. Breathing is painful and labored. If they are given early in the course of the disease, drugs effective against pasturella will minimize mortality. Effective vaccines are available.

You will commonly hear myths about the disease resistance of buffalo to specific diseases. Probably the most prevalent is that buffalo are not susceptible or are resistant to tuberculosis. This is not true; in fact, buffalo seem to be somewhat more susceptible than cattle to TB. Humans drinking non-pasteurized milk from TB infected buffalo can contract the disease. There have been no reports of SBE (mad cow disease) in buffalo. This may be due to lack of exposure or lack of testing for the disease. Buffalo are resistant to ticks, which is beneficial as a variety of diseases are transmitted by ticks (anaplasmosis, theileriasis and babesiosis). This resistance is at least partly related to their habit of wallowing and rubbing.

Buffalo are commonly infected with flukes and this is a common cause of ill thrift and death. Buffalo love to consume forage in swampy environments and these are commonly infested with fluke metacercaria.

Preventive programs and treatment protocols used for diseases of cattle are generally effective in water buffalo.

Infectious Diseases of the Reproductive System

Brucellosis: Buffaloes and cattle are equally susceptible to brucellosis. Brucellosis is reported as the major cause of abortion in buffalo in Nepal. It has been reported as a major disease problem of buffalo in India and in Venezuela. Testing procedures for buffalo are identical to those used in cattle. Be warned that normally docile water buffalo react aggressively to venous puncture and good restraint facilities are needed to perform this simple task. Prevention by cattle brucella vaccine is effective in buffalo. Brucellosis causes high levels of retained fetal membranes and this may serve as a marker for the presence of the disease. Remember that this disease is zoonotic and humans who are exposed to aborted feti or drink unpasturized milk can contract brucellosis or "undulant fever"

Leptospirosis: Leptospirosis is a common disease of buffalo and is a result of their love for wallowing. Leptospira Pomona and L. hardjo have both been found in buffalo. It is not known whether buffalo serve as a natural reservoir for L. hardjo as is the case in cattle. Affected buffalo suffered from fever, icterus, anorexia, depression, decreased milk production and passed highly colored yellow urine and sometimes yellow milk (buffalo milk is normally white with much less yellow tinge than cow milk). Buffalo rarely die from the disease but can become carriers of the organism. Bovine vaccines are effective in preventing the disease and tetracycline is effective in clearing carriers. This is a zoonotic disease and can be contracted by humans bathing in water where buffalo wallow.

Unknown Pathogenicity: Camplyobacter fetus, Tritrichomonas, and Infectious Bovine Rhinotracheitis have all been found in buffalo. These disease agents are responsible for reproductive failure in cattle. However, their role in buffalo infertility has not been proven.

Improving Reproductive Performance

A study was done in the Philippines on the impact of herd health programs on Water buffalo production. Parasite control programs were put in place as were immunization programs and calf health programs. All cows were put on a reproductive program which was similar to a U.S. dairy reproductive herd health program.

The results were as follows: Calving interval decreased by 2.2 months (17.3 months for program cows and 19.5 months for non-program cows), calving to conception interval decreased by 2.6 months (6.5 months program cows and 9.1 months non-program cows), mil production increased by 200gm. per day or by 38kg/lactation (3.8 kg/day and 1129 kg/lactation for program cows and 3.6 kg/day and 1091kg/lactation for non-program cows). Most importantly, profitability improved by 4.75US per month or 69% (15.46/ month for program cows and 10.71/ month for non-program cows).

This trial demonstrates the potential of applied veterinary medicine to develop cost effective means of improving animal health and productivity for Water buffalo.

Application of Biotechnology to Water Buffalo Reproduction

Artificial Insemination: Artificial insemination (AI) using chilled semen was first used successfully to produce a water buffalo calf in 1943. Attempts to freeze buffalo semen encountered difficulties and it was not until 1972 (20 years after the successful freezing of bull semen) that buffalo semen was successfully frozen. AI is commonly in buffalo today. However, results are often disappointing with reports of 25% conception rates following AI with frozen semen under optimum conditions. Success rates with chilled semen are higher (50-60%). The conception rate for natural service in river buffalo varies from 50-75%. The goal for AI success is to have a 60% conception rate following two inseminations on consecutive reproductive cycles 21 days apart. Many problems with AI in rural areas are a result if poor livestock management. AI programs routinely use heat observations every 6 hours with special attention paid at night. Breeding twice on the same heat (morning and evening) improves conception rates.

Collection of semen from bulls is commonly done by training them to an artificial vagina. Semen collected by electro-ejaculation can be of very poor quality. Bulls respond aggressively to having an electric probe in their rectum and excellent restraint facilities are required. With practice and experience, quality semen samples have been obtained with an electric probe. However, as in cattle, some buffalo cannot be successfully collected. Massage of the ampullae has been reported as being effective in collecting semen samples from buffalo.

Estrus synchronization: Buffalo respond similarly to a cow to injections of prostaglandins and similar doses are used. Two doses 11 days apart will synchronize a buffalo just as in cow. Progesterone implants also work in buffalo similarly to cows. Estrus occurs 50 hours after the implant is removed. There have been problems with device retention with intra-vaginal devices. GnRH does not work well to stimulate ovulation in buffalo.

Cross breeding: Cross breeding of river swamp buffalo have been done and result in the offspring having 2n=49 chromosomes. Although both male and female crosses have unbalanced gametes, they are fertile. They also display extreme hybrid vigor and have a growth rate that is 40% greater than either of the parent breeds.

Embryo transfer: Superovulation of buffalos with collection of embryos in vivo has been very disappointing. In fact, most superovulations only result in the collection 1-2 embryos. This is apparently a result of low populations of follicles in buffalo compared to cows and high levels of follicular atresia.

Summary

Water buffalo are extremely valuable animals and thrive in environment with warm weather, easily available water and small acreage farms. Their multipurpose traits make them a valuable commodity. Reproductive efficiency is low compared to that of well fed cattle. But when cattle and buffalo share the same environment and management, buffalo tend to perform better.

Improvements in production are possible through simple herd health programs that include nutrition, housing, parasite control, disease control and reproductive examinations.

Advanced reproductive techniques in buffalo have been used successfully. Buffalo can be synchronized with prostaglandin injections or progesterone implants. AI is also successful in buffalo, though pregnancy rates in buffalo are not as good as with cattle. But, even natural service conception rates are not as high in buffalo as they are in cattle. Embryo transfer at this time is not very successful due to the small yield of embryos using existing techniques.

UF veterinary researchers Maarten Drost and Wy Cripe hold Herman. Born in 1982, he was the first water buffalo conceived by embryo transplant.

For more information on water buffalo visit the following websites:

www.americanwaterbuffalo.org
ww2.netnitco.net/users/djligda.waterbuf.htm
www.pcc.da.gov.ph/

Topical Iodine Preparations: A Look Back and a Brief Overview

By Earle Goodman

Introduction

Sometimes in these days of advanced medicine and manufactured and often expensive medications, we tend to forget that there were effective medications used in the past that have fallen out of common use.

In the early days (late 1950's) of the editor's isolated rural community veterinary practice in the Southeastern US, many veterinarians and pharmacist still compounded many of their own medications.

In almost every similar practice situation, the veterinarian had a gallon (4 liter) jug of both 2% and 7% tincture of iodine at their small clinic or in a store room at home. They also carried a quart (liter) of each in their practice vehicle because they were so useful and effective in so many situations and relatively inexpensive.

They were and still are among the most effective topical antiseptic disinfectants available.

However, it is important to have some knowledge of the complications or problems that can result from their use. Still, iodine in alcohol (tincture) gives as pronounced antibacterial action on the bacteria on unbroken skin as any antiseptic in common use today.

The following information is a brief abstract on the subject from the book "Veterinary Pharmacology and Therapeutics" by L Meyer Jones, Iowa State College Press, 1954. Remember, this article was written in the early 1950's.

Iodine Tincture
Ethyl alcohol, 70 percent by weight, is an excellent skin disinfectant. When iodine crystals are dissolved in alcohol, the antibacterial action of the combination is greater than the effect of the alcohol alone. This tincture of iodine, 2 percent, rates at or near the top of most tests of antiseptic compounds. When applied to the skin, it produces a minimal irritation, spreads evenly, dries slowly, and in 3 minutes, reduces the resident bacterial flora to less than 10 percent of its original size. The strong tincture of iodine (7 percent) has greater antibacterial action, but it is irritating to the tissues. The strong tincture of iodine is still preferred by many large animal practitioners for application to the thick-skinned, food producing animals on skin areas excessively exposed to filth and bacterial contamination.

Clinical uses*:* Tincture of iodine is widely used by surgeons and practitioners for application to the skin before surgical incisions or hypodermic injections. It is used by many on wounds but some hesitate to use it because of the possibility of delying wound healing. The tincture of iodine has also been used in treatment of various skin diseases caused by bacteria, fungi, or parasites.

The strong tincture of iodine is not intended for use on open wounds because it irritates and destroys tissue and delays wound healing. It is important that the tincture of iodine never be applied under a bandage unless a strong counterirritation is desired. To leave the treated area bandaged for some time would cause considerable tissue destruction. The tincture of iodine may be washed off the unbroken skin a few minutes after being applied to avoid blistering and intense irritation. Never cover iodine treated areas with any cream, ointment, oil or medication.

Preparations
Iodine Tincture, U.S.P., is a 2 percent solution of free iodine with 2.4 percent sodium iodide in 50 percent ethyl alcohol. Isopropyl alcohol has been substituted satisfactorily. The tincture of iodine produces a characteristic brown stain when applied to the skin. Single applications of the tincture of iodine cause little irritation or damage to the skin. It may also be applied to mucous membranes, but here its action is a little strong. Repeated application to skin or mucous membranes causes blister formation with desquamation.

Strong Iodine Tincture, N.F., is an alcoholic solution containing 7 Gm. of free iodine and 5 Gm. of potassium iodide in each 100 ml. of 85 percent of ethyl alcohol. Isopropyl alcohol may be substituted for ethyl alcohol in unofficial preparations. The potassium iodide stabilizes the solution by preventing the conversion of the free iodine into hydrogen iodide and ethyl iodide, which tends to precipitate. The potassium iodide facilitates the spread of the solution and its adherence to the treated skin. In preparing the tincture of iodine, the potassium iodide should first be dissolved in the calculated amount of water because of the low solubility of the salt in the hydroalcoholic solution. The iodine crystals can be added with alcohol. Aqueous solutions are less irritating, but also less effective. They might better be used on areas without hair of thin, sensitive areas such as the abdomen and external genitalia.

In emergencies, the alcohol-iodine preparations can be used for disinfecting instruments; however, they may stain them.

It is very important to take notice of the cautions previously mentioned and the following:

- Be extremely careful not the get the preparation into the mouth, eyes, or nostrils
- Do not bandage over any of the preparations
- Do not cover any of the preparations with any type of cream, lubricant, ointment, or oily solution
- Do not allow children access to any of these preparations
- Do not use on cats