Proceedings 4th World Rabbit Congress, 10-14 October 1988, Budapest Hungary, Vol. 1, 83-88

# IMPORTANT FACTORS AFFECTING DOE LOSSES

Nephi M. Patton, DVM, PhD
Rabbit Research Center
Oregon State University
Corvallis, Oregon
United States of America

Commercial rabbit production has increased in many countries in the world during the last decade. However, we continue to see only about 10% of the rabbit farmers still in business after three years. A great deal of the failure in rabbit operations is attributable to both poor management and unwise business practices.

The most important area in any commercial rabbitry is the breeding facility. If rabbits are never born, die at birth or soon after, there is nothing to wean and obviously little to sell. Poor management of the vital procedures such as feeding, breeding, palpation, kindling, weaning and culling lead to an overall loss of income and the ultimate failure of the rabbit farm. Purchasing cheap breeding stock, buying inexpresive feed and hiring inadequate labor are economic decisions that may also doom the outcome. The doe is the focal point of any breeding facility and the early loss of successful producing does has a definite impact on not only production, but also income. The multiparous doe has to be replaced with a junior doe and the production of a junior doe is generally less and more variable. In addition, the costs of producing junior does must be taken into account. The rabbit farmer that has a doe replacement percentage of 100 per year will obviously have greater expenses than the farmer with a 50% replacement figure. Therefore, the factors that affect doe losses are extremely important.

Whenever one begins to think about the important factors that cause the loss of does from a commercial breeding herd, attention is immediately turned towards disease. However, poor reproductive performance and subsequent culling account for much more doe loss than is caused by disease.

## Doe Loss Due to Poor Reproductive Performance

The economics of a commercial rabbitry dictate that to be successful the majority of the breeding does must produce more income than expense. The closer a rabbit operation gets to 100% of the does producing a profit, the closer the operation comes to maximizing income. This means that does that are below the average production for the herd should be culled as soon as a replacement is available. Does that are below average may have a number of different problems. Some are correctable and many are not. In a well managed operation

does should be evaluated after the third parity. If a doe constantly kindles less than 6 live young, or whatever the herd average, she should be culled. After examing hundreds of doe records at the Rabbit Research Center at Oregon State University, it has been determined that does with three small litters in a row seldom have a large litter.

Another situation that should result in culling is the doe that has litters that are above average in number born alive, but does not successfully raise them to weaning. This may be the result of several factors such as: poor milking, poor mothering, inadequate feeding, or disease. Poor milking ability is the basic cause of "starve outs" in the nest box. Sometimes poor milking on the part of the doe may be a managerial mistake and not the fault of the doe. Inadequate feeding or feed containing the wrong nutrients does not allow the doe to reach her lactation potential. This can be corrected by a change in diet or in the amount of feed offered to the doe. Poor mothering by a doe who will not nurse the young can cause malnutrition in the kits. Nervous does who trample their young can also cause losses. Inadequate or improper feed can cause poor conception, abortion and the birth of weak litters. Sterility in a doe is not common, but is certainly a cause for culling the doe. Disease in the young can cause death, but that may or may not be attributable to the doe.

The reproductive performance of the doe declines as the doe ages and should result in the culling of the doe. While good data does not seem to be available on commercial rabbits, it has been observed at this institution that litter size begins to decline in pasteurella-free rabbits used in intensive breeding systems around 20-25 litters.

Doe Loss Due to Disease

In conventional rabbitries the greatest loss of does from disease, both from death and culling, is due to pasteurellosis. The disease organism *Pasteurella multocida*, is endemic in rabbits in all countries. The disease is incideous and is seen in many forms, the most common being snuffles. Pneumonia, abscesses, torticollis (wry neck), metritis, orchitis and some forms of mastitis can all be attributed to *P. multocida*. If pneumonia doesn't kill the doe, then one of the other forms of pasteurellosis will most often cause the doe to be culled from the herd resulting in basically the same outcome, i.e. loss of the doe. In addition, pasteurellosis weakens the doe and maybe a factor in poor reproductive performance. Active cases of pasteurellosis often cause weight loss in the doe and the thinner she gets the greater the chance for low conception, abortion, weak litters and poor weight gains in the young. Pasteurellosis is

virtually untreatable and to date an effective affordable vaccine has not been developed. The advent of the specific pathogen-free rabbit, which is free from P. multocida is quickly becoming a realistic alternative. SPF commercial rabbit herds are springing up in many parts of the United States and Canada. Owners of these herds are reporting not only increased production but also increased longevity of the does. By switching entirely to SPF rabbits the rabbit farmer is able to maintain the pasteurella-free status in traditional rabbit barns that have been disinfected.

Although pasteurellosis causes by far the greatest loss of adult rabbits, there are other disease that will also cause the doe to be culled. The frequency of these "other" diseases depends on the country and the individual rabbitry.

Mastitis is common in some rabbitries. The primary etiologic agent is Staphylococcus auereus. The initial signs of mastitis are anorexia (going off feed), elevated anal temperature and congested mammary glands. If these sysmptoms are observed immediately, the doe can be effectively treated with antibiotics and salvaged. If it is allowed to go untreated for several days, the outcome can range from septicemic death to abscessed mammary glands. If the doe loses more than one mammary gland she probably will not be able to continue as an economic unit and should be culled. Strict sanitation of nest boxes and cages helps to prevent this disease. Disinfecting nest boxes twice, once after cleaning and a second time just prior to placing in the cage, will help reduce the incidence of mastitis.

Pododermatitis (sore hocks) prevents a doe from doing well in reproduction. Sore feet not only restrict her activity, but also serve as a potential open wound for the introduction of bacteria and a resulting septicemia. Treatment of this condition is not effective. Selection of breeding rabbits with wide feet and thick foot pads is very helpful in preventing pododermatitis.

Conjunctivitis or "Weepy eye" is most commonly caused by Staphylococcus aureus. This antibiotic resistant bacteria causes the conjunctival membrane to become inflammed. Subsequently the nasolacrimal duct becomes occluded. The secretions of the eye can no longer take their normal pathway and begin spilling over the lower eye lid at the medial canthus of the eye. This causes fur loss from the medial canthus of the eye down the side of the face. While this is not a fatal disease, it does cause the loss of the doe because they should be culled. If these rabbits are allowed to stay in the herd, they become a source of infection for both mastitis in the does and staphylococcal septicemia in the young.

Malocclusion (buck teeth) is like pododermatitis in that it prevents the doe from functioning properly. Does with overgrown incisors do not eat well and

become very thin. This reduces their fertility and lactation. In addition, malocclusion is generally considered to be a genetic recessive disease and utilizing does with this condition increases the genetic pool of the gene in the herd. While some malocclusion can be caused by rabbits pulling on wire and causing a misalignment of the incisors, it is difficult to differentiate this type of malocclusion from the genetic type and the final outcome is the same. Both types cause the doe to become a "poor doer" and must be culled from the herd.

Mucoid enteropathy (mucoid enteritis) is seen in some herds on a cyclic basis and in others sporadically. The does go off feed, generally develope a mucoid-type diarrhea and eventually die. The course of the disease takes anywhere from a few days to a few weeks. At postmortem the most consistent lesion is an impaction of the cecum with sometimes the distal ileum and proximal colon involved. While the etiology of this disease has not been completely worked out, there are indications that diet is involved. Switching to a new brand of feed or changing the formula in use often times results in prevention of new cases. Because the affected rabbits become very dehydrated, parenteral fluids are sometimes helpful in salvaging the doe if her condition hasn't deteriorated too badly. Most does that develope this disease will die and in some herds it is major cause of doe loss. Abdominal palpation of a doe off feed will often reveal the cecal blockage. Treatment should be instituted immediately or the doe should be culled if she is in reasonable condition.

A trichobezoar (wool block) will also cause the doe to go off feed, but no cecal blockage is detected on palpation. The temperature is usually normal as it is with mucoid enteropathy. Sometimes a mass can be palpated in the stomach if the trichobezoar is large. Radiographs with contrast media are helpful. Does with this condition live for extended periods of time, two to three weeks without eating is not uncommon. The doe eventually dies and obviously becomes a poor economic unit long before death. Diagnosis is often made at necropsy, but if the condition is suspect, treatment with oral fluids containing the digestive enzyme bromalein can be helpful.

Hepatic coccidiosis can be a major problem with inexperienced rabbit raisers and results in devastating losses. The protozoan parasite Eimera stiedae attacks the epithelial lining of the bile ducts in the liver causing 2-4mm white spots. This disease interfers with the function of the liver and the doe becomes emaciated and either dies or is culled. While this disease is most common in fryer rabbits it is also seen in young does. Older rabbits

that live through the acute stages seem to develope a certain amount of immunity.

Myxomatosis, while only found in two states in the United States of America, can cause a sizable loss of does in rabbitries around the world. This viral disease occurs in two forms, an acute septicemia which results in death within a few days and a more chronic form that results in swollen eyes, ears, nose and vent area. These rabbits also die, but it can take weeks. The disease is mosquito borne, but can be transmitted by direct contact of rabbit to rabbit. The disease may also be transmitted by the handler going from sick rabbits to healthy rabbits. The disease is nearly always fatal. When an outbreak occurs in the doe herd an immediate quarantine should go into effect and all affected rabbits killed and buried. Because the incubation period can be as long as 16 days, a careful daily check of the rabbits must be made. Rabbits off feed or looking abnormal in any way should have their rectal temperature taken. One of the earliest signs of myxomatosis is a fever spike of about 105-108$^{o}$F (40.6 - 42.2$^{o}$C.). Any rabbit with an elevated temperature should be immediately killed and burned or buried. A vector program should also be instituted to reduce the number of vectors in the rabbitry. By killing affected rabbits, improving sanitation and controlling the vectors, the outbreak can be stopped. In some countries a vaccine is available which may not only act as a preventative, but also may help in the spread of the disease to non-affected animals during an outbreak.

An occasional doe is lost due to injury. The most common injury is luxation of the vertebrae or "broken back". This condition is generally due to improper handling, but can also occur spontaneously. Does and bucks have been known to fracture or luxate their own vertebrae by sudden movements when frightened (this is one of the reasons that music or some kind of background noise is important in the rabbitry to help keep the rabbits calm). The result of the fracture or luxation is a posterior paralysis that may or may not include urinary and bowel incontinence. Rabbits have extremely powerful hind legs and carrying a heavy doe by the scruff of the neck with little support for the posterior part of the rabbit can result in violent thrusts of the back legs and the possibility of injury. Tattoo boxes have also been incriminated in back injury. Paralyzed rabbits should immediately be culled from the breeding herd.

Heat exhaustion in warm climates can be a major cause of doe loss. Does in their last few days of pregnancy become extremely uncomfortable in temperatures that exceed 90$^{o}$F (32.2$^{o}$C). If a doe has a fairly large litter in the

uterus, the uterus presses on the diaphram and keeps the doe from normal respiratory movements. This causes heat to build up in the doe and, lacking sweat glands, the doe has no way to get rid of the excess heat. Does with heat exhaustion will open their mouth and begin to pant like a dog. If this occurs and you do not reduce the doe's temperature by sprinkling or bathing the doe in cold water or by reducing ambient temperature, the doe will probably die of overheating.

There are vices that certain does develope which should result in their being culled from the herd. The first is fur chewing. If there is a major fur chewing problem in the herd, then a dietary problem should be suspected. However, if one particular doe begins to denude the young and sometimes herself while the other does do not, a vice should be suspected and the doe culled if she repeats this performance with the next litter. A second vice is ear nibbling and/or cannibalism. Certain does will chew the tips of the babies ears and sometimes the entire ear. A generalized problem in the herd suggests a dietary problem, but one individual doing it may be a vice. A third condition may be a vice or a disposition problem. Some does become extremely aggressive when their litter is born. This usually decreases as the litter ages. An occassional doe becomes aggressive with the first litter and never changes. She will attack anyone at anytime. These "mean" does become very difficult to work with and should be culled as this excessive agressiveness may show up in the offspring. Does that urinate in the nest box are often culled because the urine stains the babies and in cold weather they often die. This habit can sometimes be changed by wiring a urine soaked block of wood to the opposite side of the cage from the nest box. If this is unsuccessful, then its best to replace the doe.

While there are many factors that result in the loss of breeding female rabbits, the most important factor of all is the management. There is no substitute for experience and knowledge. Good rabbitry operators have both of these traits and their doe losses are considerably less than the new or inexperienced operator. The goal of all who work with rabbits should be to attain this vital attributes.