Study on Dead Fetus of Rabbit

Zilin Gu[1, 2], Yuhua Zhang[1], Baojiang Chen[1], Wenshe Ren[1], Yuting Huang[1]

(1. Mountainous Areas Research Institute of Agriculture University of Hebei, Baoding, Hebei 071001, China.

2. Animal Science & Technology College, Northeast Agricultural University, Harbin, Heilongjiang 150030, China)

Abstract: Dead fetus is one kind of reproductive disease of rabbit and the cause of the disease is complicated. The drug poisoning, toxin, machinery harms and metabolic obstacle made the fetus stop growing in the mother's body before birth. The difficult position and the fetus were too big and made fetus die. Owing to any sort of causes, this was very quick death after birth. Cold condition made the particularly weak fetus die in postpartum easily. Dies in postpartum do not belong to the scope of stillbirth, but since it was difficult to check out, in most condition the number was accounted within dead fetus rate falsely. Mould feed was major coarse feed, such as peanut hull, potato straw, peanut straw, dried hey, wheat bran, distillers and the high water content raw materials. Deficiency of nutrition, such as vitamin A, vitamin E, trace element iodine and selenium etc, could cause fetus dead. Inoculation, keeping rabbits in a sanitary condition, having the pharmaceutical preventions and getting rid of illness are important for the rabbits to keep from the dead fetus. [Nature and Science. 2004;2(3):79-83].

Key words: rabbit, dead fetus, mould toxicosis, olaquindox toxicosis, gossypol toxicosis

1 Introduction

Rabbit reproduction is the foundation of expanding crowd and raises the beneficial result. So, breeding is the focal and difficult points of foster rabbit. In many years on the rabbit researches, the authors ran into many breeding difficulties, for example, low pregnancy, false pregnant of conception rate, having a miscarriage and dead fetus etc. Among them, the dead fetus was one of universal breeding diseases in recent years. For this we conducted about 2,000 dead fetuses near 10 years. Also, we classified and analyzed the dead fetus, pointed out the main points distinguish and put forward preventive technology measurement.

Dead fetus is one kind of reproductive disease of rabbit and the cause of the disease is complicated. The feed is the most important factor. First, when a rabbit dies before birth, the fetus stops growing in the mother's body before birth due to various reasons. The causes could be follows: The drug poisoning, toxin, machinery harms and metabolic obstacle, etc. Second, when a rabbit dies in birth the fetus develops normally in the mother's body during the delivery and the fetus is dead owing to any sort of causes, and its main reasons are fetus position incorrect and the fetus is too big. Third, when a rabbit dies after birth, the female rabbit gives birth to the fetus smoothly, but poor environments such as low temperature made the particularly weak fetus die in postpartum. The dead fetus was divided into 8 groups according to the detailed causes leading to dead fetus. These were mould feed, mould toxicosis, olaquindox poisoning, nutrition deficiency gossypol toxicosis, poisonous blood disease of gestation, germs infection, germs infection, overtime of delivery and genetic disease. The points of the appearance and diagnosis were different because of different reasons leading to dead fetus. The scope of mould toxicosis which caused fetus died was very large, the small scope was 1-2 dead and the large was all small dead fetus, and the development was basically normal. Most of the fetus' belly skin was purple and black, viscera bleed and gore, and rear canker. Parts of pregnant rabbits had an abortion, sometimes had enteritis. It happened in a

year but the chance to get the disease in spring was the highest and any medicine and added vitamin or other nutrient had no effect on the course of getting disease. It would be converted to be normal after ten days if the feed was changed; the scope of olaquindox poisoning leading to dead fetus was very large and accompanied abortion in batches. Most of the fetus development was abnormal even some did not come into shape. No medicine and nutrition had effect. When stopping feeding olaquindox the situation would be better off, and after ten days the rabbits recovered as previously. The scope of gossypol toxicosis leading to dead fetus was very large and it would happen after feeding poisoning foster for ten days. Its main characteristics were abortion, the fetus abnormal, the female rabbit's lactation declining, mating ability of male rabbit decreasing and pregnant rate dropping. Abnormal fetus represented big head, brain amassing liquid and skull cicatrizing badly. When stopping feeding, gossypol the situation would be gradually better off. Nutrition deficiency, especially vitamin A and E, brought fetus to death and this was more often seen. Its appearance was dead fetus accompanying abortion, pregnant rate dropping, the number of birth decreasing, survival fetus eyeball development abnormal, some even no eyeball, some easy to get conjunctivitis; and the death resulted from poisonous blood disease of gestation only take place on particular rabbit. In gestation later period or postpartum, the mother rabbit frequently had a jaded appetite or refuse to eat, some died postpartum or paralyzed postpartum, the fetus development was basically normal yet low activity. Exhale gas and excretive lactation had a smell of ketone. For some fetus resulted from infected germs, female rabbits had evident ill record such as diarrhea, abortion, vagina bleeding, etc. For the fetus resulting from overtime delivery, the number of the fetus (most female rabbit) gave birth very lowly, therefore young rabbit in the mother body grew very well and it lead to overweight. The genetic dead fetus took place among small scale rabbit farms or the farms ignorant of blood type match.

2 Classification

2.1 According to the Time

2.1.1 Before birth

The drug poisoning, toxin, machinery harms and metabolic obstacle made the fetus stop growing in the mother's body before birth.

2.1.2 In birth

The difficult position and the fetus were too big and made fetus die.

2.1.3 After birth

Owing to any sort of causes, this was very quick death after birth. Cold condition made the particularly weak fetus die in postpartum easily. Dies in postpartum do not belong to the scope of stillbirth, but since it was difficult to check out, in most condition the number was accounted within dead fetus rate falsely.

2.2 According to the cause

2.2.1 Mould toxicosis

Mould toxin is poisoned to the fetus by the mouldy food. It normally affects the digest system, respiratory system or nervous system, while hardly affects the reproductive system.

According to some reports, the livestock mould poisoning-disease was chiefly arisen by aspergillus, such as Asp. Fumigatus, Asp. favus, Asp. Nidulans, and Asp. Niger, etc. The mould toxin could make the animal ill.

Asp. fumigatus universally existed in the environment and the similar bacteria toxin of smoke aspergillus could cause many animals (such as rabbit, guinea pig, small white mouse and chicken) paralysis or die. It could infection cattle respiratory tract, gestation womb and fetus to cause pathological changes. Half of 2000 dead fetuses the authors conducted were poisoned by the mould toxin. Because the various mould toxin, the physiology state of rabbit, the invading way and capacity of toxin were different, and the clinical symptoms were also different. According to the study, there were other clinical symptoms, such as enteritis, hepatitis, paralyzing or weak and limp etc., beside the dead fetus and miscarriage. These kinds of the mould toxin that cause rabbit fetus die remain to go deep into research.

The authors found that the mould feed was major coarse feed, such as peanut hull, potato straw, peanut straw, dried hey, wheat bran, distillers and the high water content raw materials.

2.2.2 Olaquindox poisoning

In recent years, much olaquindox was added into the food, which could often make rabbit fetus die. Olaquindox was found to accelerate the animal to

grow and keep in good hacteriostasis in 1965 by West Germany Bayer Animal Health Corporation. It was sensitive to G^-, such as E. coli, Salmonella, Proteus etc. It was 50-100 μg/ml for G＋, which was wide-ranging add to promote growth and cue disease. Blindly, a great quantity and long period of time using created the rabbit to be poisoned. In China, it was regulated consumption in the piglet feed for 15-50 g/ton, and taking the place of the feed 50-100 g/ton, the chicken feed 15-25 g/ton in the feed. According to investigation, the authors found that it was 100 g in 100 kg in the rabbit feed, sometimes even 200 g, which was over 20-40 times of the normal dose. Thus the rabbit poisoned was unavoidable. In the 2000 fetuses, according to study, it was about 30% by olaquindox.

2.2.3 Gossypol toxicosis

Gossypol is the major yellow pigment in the cotton seed pigment gland, and it chiefly exists inside the cotton seed. As usual pigment gland weight was the 2.4% - 4.8% of cotton seed's, and gossypol weight was 20.6% - 39% pigment glands. The toxicity of free gossypol is not the strongest, and its content is far higher than several kinds of pigments. The toxicity of cottonseed cake depends on the content of free gossypol. Rabbit is one of the most sensitive animal to the gossypol. According to datum, there were four ways the animals were poisoned. First, direct irritation of the stomach and bowel mucosa causes inflammation, and then it influences organs, such as the heart, liver and kidney etc. Second, combining with protein and iron it reduces some enzyme activities and causes short of iron anemia. Third, the diminishing male animal creates breeding the function or sterility. Fourth, it causes deficiency of vitamin A and low blood potassium disease. The authors found when the cottonseed cake was daily grain 10%, it was possible to accumulate poisoning [3]. When more than 15% easily, dead fetus was one of poisoned symptoms.

2.2.4 Nutrition deficiency

For the female rabbits the period of gestation needs a great quantity of nutrition in order to satisfy the needs of the fetus growth. Short of necessary nutrition causes fetus growing obstructed, and seriously causes fetus weak and dead.

Deficiency of nutrition, such as vitamin A, vitamin E, trace element iodine and selenium etc, could cause fetus dead.

Generally, seriously shortage of nutrition causing fetus die occasionally occurred (5%).

2.2.5 Poisonous blood disease of gestation

In later period or postpartum of gestation, the mother rabbit frequently had a jaded appetite or extremely useless, and it needed that the fetus grew and secreted the milk that caused the decomposition of mother rabbit protein and fat, and gave rise to ketone (acetyl ethanoic acid, β-hydroxyl butyric acid and acetone acid). When the ketone was decomposed they could create the ketone blood disease. It influenced not only fetus die, but also seriously made mother rabbit die. This kind of dead fetus was about 5%.

2.2.6 Germs infection

In gestation period, that the mother rabbit was infected by germs and suffered from bacteria (such as Salmonella and E. coli) caused the fetus die in later period (such as Salmonella fungus disease and E. coli disease).

2.2.7 Overtime of delivery

When the fetus had grown greatly, period of gestation prolonged and mother rabbit gave birth difficultly. The fetus at the birth canal was put off and the birth canal oppressed the umbilical cord, which created the fetus to supply oxygen shortcoming and caused death. This kind of case often occurred for the mother rabbit, which bred with early stage and had few fetus.

2.2.8 Coinciding of disease

Some deadly or half deadly genes in the gestation later made fetus stop growing. It often occurred that the farm scope was smaller and the blood relationship was near.

2.3 TYPICAL CASES

2.3.1 The first examples

July of 1999, in a rabbit farm of Hebei, China, there were 200 mother rabbits. Since 1996, only 329 young have been lived. The dead fetuses were 1606 and dead rate was 82.3%. Most dead fetuses had normal shape and some back were festered. The young hare majority opened the eyes later, and had a gum or not the eyeball. Meanwhile, the miscarriage rate was high (about 10%). Though using many kinds of pharmaceuticals, the dead fetus rate was also high. Since autumn of 2003, ration formula did not change. That was: Maize 22%, wheat bran 20%, soybean cake 20%, ground grass (maize straw and beanstalk) 35%, yeast 1.4%, sodium chloride 0.6%, vitamin and trace element additive 1%. It did not add any

pharmaceuticals. The feed was pellet, the management was standard and the hygienic conditions were good. They used the fishing pellet machine and added more water when pressing the grain, then exposed to the sun under sunlight. It was no problem in winter and it was gradually warm. Feed got mouldy when it was raining. The pellet, which had fed to the rabbit, got mouldy to a different extent.

Therefore the authors believe that the dead fetus was caused by the mouldy feed and exceedly exposed to the sun, which caused the vitamin deficiency for a long time. The measure adopted was: stopping the mouldy diet immediately, the fresh raw materials were compound again, and adding 1% "TULE additive (produced by Mountain Area Research Institute of Hebei Agriculture University), the feed dried in the shade at the sunny day. Within 10 days, 26 survived among 96 young rabbits, the others were the dead fetuses. After these measurements were done, only 4 of 11 litters were dead fetus. Until this spring, it was normal.

2.3.2 The second example

In the spring of 2000, in a rabbit farm of Sichuan Province of China, the dead fetus and miscarriage occurred in more than 80 female rabbits. The raw materials were not mouldy and nutrient was sufficient. Other disease did not occur. The investigation showed that 120 g olaquindox were added into 100 kg female rabbit diet for the prevention and curing infectiousness rhinitis during the pregnancy period and the miscarriage, and dead fetus occurred after 7 days. After the diet stopped 10 days rabbit recovered to normal.

3 Main Point of Diagnosing

The different reason appeared different symptoms. The main points were:

3.1 Mould toxin caused most, even all litters were death

The fetus grew normally, and most bellies turned blue and black. In the back of fetus there was fester. The part of pregnant rabbits had a miscarriage. Some occurred enteritis. All the year, especially in spring, it often occurred. It was invalid with any pharmaceuticals and vitamin. It would be normal after ten days the mould feed was changed.

3.2 Syndrome caused by olaquindox was often accompanied with miscarriage

The fetus grew abnormally and some had not shaped. It was invalid with any pharmaceuticals and the nutrition matter. It was better and better when olaquindox was stopped after 7 days, and became normal after 10 days.

3.3 Happen when the rabbits were fed with gossypol feed after 10 days

Often accompanying with miscarriage, female rabbit milk and the breeding ability of male rabbits would reduce. The lopsided fetus showed that the head was big, and hydrocephalus and skull were not healing up. When stopped feeding gossypol it was normal.

3.4 Occurred by vitamin A or E deficiency

Accompanying with a miscarriage and conception rate and litter size reducing, the most living young rabbits were suffering from conjunctivitis because of adding none of any green feed and vitamin for a long time. The rabbits would recover to normal after replenishing vitamin.

3.5 Occurred by the poisonous blood disease of gestation of mother

Many mother rabbits had a jaded appetite or stopped eating before giving birth, and some was dead or paralyzed postpartum in postpartum. The fetus grew normally, but the vigor was small. Gas that mother rabbits breathed out and the milk secreted had ketone tart flavor. Fat and thin weak mother rabbits easily occurred, and large-sized rabbit was more than medium-sized or the small-sized.

3.6 Caused by the bacteria infection

The mother rabbits had obvious ill history, some accompanied with the diarrhoea, miscarriage and bleed copiously from the vagina symptoms. It was difficult pregnant and the womb festering for the ill mother rabbits in most postpartum.

3.7 Caused by overtime of delivery

The majority of the female rabbits had few litter size and fetus grew well in the mother's body. The weight was excessively big because few fetus's irritation to the mother's body was too small to lengthen in the birth canal. The dead fetus majority was singleton and the first fetus was the highest weight. The fetus head had bleeding or extravasated blood, and the body was blue and black. Generally the fetus had fine and soft hair.

3.8 The heredity dead fetus only occurred in the small scale farm or inbreeding

Owing to the different harmful gene, the dead fetuses were different from some extent. Some

growths were accomplished, and some still did not have the shaping. If the above ill rabbits bred once more, the rate of dead fetus was very high.

4 Prevention Measure

The trend of dead fetus has increased year by year and it should be paid more attention to this problem. The dead fetuses by mouldy feed were half of all, so that it was important to prevent the feed from getting mouldy. Pay attention to the moisture content of the raw feed materials not only during the gathering, drying and storing time but also during the producing time. It should consider to add mould inhibitor into the feed during summer. All mouldy feed should not feed to the rabbits. If the rabbits was poisoned by the mouldy feed, it should immediately stop feeding the mouldy material and add vitamins to drinking water or ration in order to prevent from toxin. In the short of the selenium district, the content of selenium could be increased. This activated oxidizing ferment and accelerated the decomposition of the toxin. After poisoned by the other poisonous matters, the above measures could be adopted.

At present, olaquindox was abused and the harm was serious. Therefore the authors suggested that osaquindox should not be added during gestation and the using time should not be over 3 days in the other period.

Gossypol was a kind of toxin. The using of cottonseed cake should be especially carefully. According to authors' experiences, the cottonseed cake content in rabbit diet should be controlled within 8%, and it was safe to feed the commercial rabbits but should not feed to breeding ones.

The rabbit reproduce performance is related to nutrient, particularly vitamin A and vitamin E. As we know, it could gain the 10 times benefit than the input (cost of vitamin A and vitamin E). Owing to a large scale of breeding, it was impossible to provide vitamins by pasture. Therefore, the vitamin additive was indispensable. Generally, the adding capacity of vitamin A was 10000 IU/kg, and vitamin E was 30 mg/kg.

It was very dangerous if the mother rabbits did not eat before giving birth. The author thought that the mother rabbits should eat the high content nutrition feed, such as delicious or digests glucose water and milk. This should be important for the rabbits to keep its nutrition requirements and avoid poisonous blood to cause occurring of gestation disease.

The authors' investigations found that the fewer litter size, the more dead fetuses were reduced in the difficult labor. It should diagnose rabbit gestation condition regularly. When the litter size was few it will be easy to control the feed capacity. On the other hand, if fetus was within 4, it could hasten parturition while delivering 30th day. If the rabbits had few litter size, we should check mother rabbit fat or vitamin deficiency.

Inoculation, keeping rabbits in a sanitary condition, having the pharmaceutical preventions and getting rid of illness are important for the rabbits to keep from the dead fetus. Carrying on blood relationship registers and controlling closely breeding are the strong measurement to prevent heredity dead fetus.

Correspondence author:

Zilin Gu
Mountainous Areas Research Institute
Agriculture University of Hebei
Baoding, Hebei 071001, China
Telephone: 01186-312-7526340 (Office)
Cellular phone: 01186-13582058716
Email:hebaugzl@sohu.com

References

[1] Feng D, Wang J. 2000. Forage hygiene, Xi'an Map Press. 2000.

[2] Gu Z. Chronic poisoning of the rabbit. Journal of Chinese Rabbit 1987:1.

[3] Gu Z. The diagnosis of weak and limp disease of rabbit. Journal of Chinese Rabbit 2001:1.

[4] Li M. Feed additive. Beijing University Publishing House. 1991.

[5] Zhang R. Domestic animal pathology, Beijing Agriculture Press. 1981.