
ORIGINAL RESEARCH ARTICLE

How to improve the survival rate of calves

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ABSTRACT

As a reserve force for a pasture, calf determines the future of the ranch and the future profit of the ranch. The calf's scientific rearing is the most important part of sustainable development of a ranch. Calf management is a complex and detailed work, breeders need to consider three factors: nutrition, disease, and environment. In order to make calves become a good reserve cattle, it is important to ensure that calves have a balanced, adequate nutrition, reduce calving morbidity, mortality, and a suitable environment. More excellent young cattle can produce more prolific lactation cattle. This article introduces the calf feeding and management work from the feeding and management, environmental management and other aspects.

Keywords: *calves; feeding and management; weaning*

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Introduction

0 ~ 6 months age cattle called as calves, calves feeding and management can generally be divided into two stages, the first stage called lactation, that is, 60 days after the birth of calves stage, the second stage is the weaning period, that is, calves born between 60 to 180 days stage. In these two stages, the function of the body organs of calf have not yet fully excited, the body protection mechanism is not yet sound, poor resistance to disease^[1], so breeder needs to strengthen the feeding and management in this two stages.

The development of calf breeding stage is the most important. With the development of animal husbandry, the rise of pasture management and the increase of lactation yield, the calf feeding and management has also been paid much attention. Many ranches increase investment in the calf cultivation, but the blind investment will not guaranteed to bring the desired benefits, especially in the calf management. Many feeding detail need to pay attention carefully, each detail will affect the calf health and growth of cattle from birth to weaning.

The purpose to improve the survival rate of calves

The calf is the main force of the dairy farm, the calf's feeding and management can affect the future performance of the herd, and the future profit of the dairy farm. Let calves become a high-quality reserve cattle, can replace the infertility cattle, multiple abortion, and dairy cows with low milk production. This can save the feed, and also can improve the milk production, thereby increasing the profitability of cattle.

The new calf feeding mode

In dairy industry, the survival rate of lactating calves is more than 99%, weaning calves survival rate is about 99.98%, while the survival rate of calves in China is only 90% to 97%, which has a significantly different if compared with other countries. This is closely related to the management of calves in China, there is a more mature calf feeding mode called as 'calf kitchen'^[2] in countries such as New Zealand, Australia, Britain, and etc.

'Calf kitchen' concept

'Calf kitchen' is a term derived from a simulation of human kitchen, the purpose is to refine and standardized the management for new calves. There are lockers for colostrum milk and milk substitutes, equipment for calf food, equipment for calving, and clean disinfection and sewerage. Nowadays, calf refinement management is common in dairy industry, the research and application in this area is still rare, but the rapid development of animal husbandry in China indicates the future implementation and application of 'calf kitchen'.

'Calf kitchen' points

Through the 'calf kitchen' fine management, the nutritional needs of calves can effectively ensure, improve the food environment, and reduce morbidity. 'Calf kitchen' should have the requirements: there is enough space to store fresh milk and milk powder, drainage pipe layout is reasonable, and to ensure adequate supply of cold water and hot water; necessary processing, heating, freezing equipment (such as sterile water pipes and drying equipment), the bottle can be bottled, filling and milk barrels for cleaning and disinfection, the transport channel requirements convenient and convenient, no need to clean up the equipment, to ensure the safe transfer of fresh milk pollution, besides cleaning brush and gloves must be necessary and cleaning clothes; can accurately quantitative, fixed, fixed temperature feeding. And the effective monitoring of the quality of milk; have enough dry storage of milk powder and substitute milk powder additives, and the proportion of milk powder should be accurate to ensure the calf nutrition.

Calves fine management

Lactation feeding

Nursing at the time of birth

Mothers do natural delivery as far as possible, natural childbirth on the future breeding of calves are beneficial. Calves should first clear the mouth and nasal mucus after birth to prevent breathing difficulties and foreign body pneumonia. If already inhaled, two staff can raise the calf down, hand the chest, or use straw to insert into the nose to sneeze, and hay or dry cloth to clean the mucus on the surface of calf body. Calves often cut off the umbilical cord naturally after born, in case of non-broken, can use disinfection scissors to cut it at about 6 cm away from the calf abdominal, it is best

to cut off by hand, and then fully disinfected with iodine tincture to avoid umbilical corditis. After that the new calves will be transferred to the nursery for weighing purpose^[3].

Feeding colostrum

Feed calves colostrum as early as possible, preferably within 30 minutes after calves stand up, the latest cannot be more than 1 hour. The colostrum mass, specific gravity, and immunoglobulin quality were measured before feeding using a colostrum mass spectrometer. Adhere to the quality of qualified colostrum (immunoglobulin content of more than 50 mg / ml) for the first time fed 1 ~ 3L, 5 hours to feed the second time, so that calves get enough antibodies in the 12 hours after birth^[4]. Feed 3 to 4 times at the day of calves born, must feed at least 6L. Colostrum is very important for the newborn calves, colostrum contains lysozyme and immunoglobulin which can inhibit or kill a variety of bacteria. Colostrum in the immunoglobulin, lactoferrin, immune cells and other unknown growth factors, such as milk-derived peptide factors, can enhanced calf immune function and promote calf intestinal growth and development role. Milk is best to feed immediately after squeeze to maintain milk temperature, the appropriate colostrum temperature is 38 ± 1 °C. If you are cryopreserved colostrum or have cooled the colostrum, colostrum should be heated to about 38 °C before feed, colostrum with low temperature can cause calf gastrointestinal digestive disorders, leading to diarrhea^[5].

Often milk feeding

Calves will transfer to the calf island after born for 3 days, they began to feed by milk, pre-calving body weight of 15% for feeding, often milk feeding was 'hillside'^[6], that is, feed 6L milk daily in the first three days of milk feeding, after they started to feed by often milk, increase the feeding with the increase of weight in the first 20 days, feed its body weight of 15% milk daily, after 20 days gradually reduced the milk feed. It is best to use a breastfeeding bottle (with a scale) when feeding, this can train the calf's sucking ability, which helps the calf esophageal groove to closed, so that milk can directly into the wrinkles. There are something that must done in breastfeeding: quantitative, fixed temperature, certain people, milk temperature, if the temperature is too low can easily cause calf diarrhea. Besides, tools, milk and calves' mouth must be clean when feeding^[7].

Calves Open Food

In order to make the calves weaning as soon as possible, should feed calves early, feed calves with open food after they born 5 to 7 days. Paving high quality hay in calf column to train calves to eat hay. The amount of hay added increases with the increase in age, which promote calf rumen and network development. After 10 days, train calves to feed concentrate, feed 15g ~ 25g in the first day, then gradually increased, 1 month can be increased to 250 ~ 300g, 2 months can be increased to 500g, and feeding clean water daily^[8].

Weaning Feeding

Calves that born in February weaning according to the situation of eating and feeding materials, weaning calves face an important turning point in growth and development, they began to change from the feeding of calves to weaning calves. Higher requirements are important periods for determining calves' future milk production, raising and feeding solid food as soon as possible, creating a favorable environment to promote rumen development^[9]. If the food is available for up to 2.5 kg per day for three consecutive days and can be fed with high quality hay at any time, weaning can be carried out, and the sick calves may be extended to lactation and increase the amount of breastfeeding. Lactation cannot be too long, although calf get weight gain, but this is not good for the calf's internal organs, especially for the digestive organs, and also increased the breeding costs. Cows with high-feeding of milk have fat body, the abdominal circumference is small, eat less, and can't yield much milk in future^[10].

20 days before weaning, broken carrots or sugar beet of 200 ~ 300g can be added in the, then gradually increased, after 2 months can be increased to 1000g, after 3 months can be increased to 2000g, beets and carrots and other juicy feed can promote the development of anterior stomach of calves. Weaning can begin to train calves to feed silage, which can promote calves to promote the formation and stability of intestinal microflora in calves^[11].

Environmental Management

Health

The calves should be immediately transferred from the delivery room to the nursery stock after birth to prevent the spread of virus from the delivery room and the cows to the calves. The nursery should be kept warm (13 to 19 °C) and the mats are clean^[12]. After three days move the calves into the calf island,

the calf island can be outdoors or placed indoors. If calves born in winter, the best calf island is to be placed indoors. For calves born in summer, the calf island can be placed outdoors. Extra attention need to pay for cleanliness of calf island in summer, it is important to keep the calf island dry. In winter, extra attention need to pay for the temperature of calf island, windproof and calf drinking water temperature.

Every day, all containers, utensils and the surrounding environment must be clean after every meal, put the bottle upside down to drain it, this can effectively reduce the breeding of mosquitoes and bacteria to reduce the spread of the disease. After calves are fed, keep their mouths wiped clean and prevent them from sucking each other^[13].

Litter

From the birth to the weaning, calves spend about 75% of the time in lying on ground, which makes the management of the litter is particularly important to reduce the spread of pathogenic microorganisms which can cause diarrhea, calf cages should be thick enough to allow calf to lying down, the litter can cover the calf's legs completely, changing it for each 2 days as much as possible because the calves have to feed the haystack to promote rumination, so keep the litter clean^[14].

Hot and Cold Stress

For the northern ranch, the cold winter is a big challenge for calves feeding, keep warm is the key to improve the survival of calves. The practice of modern animal husbandry group is worth learning: Yuba, electric heating and other equipment is used to make a warm room in the calf homes and delivery room, warm room can ventilate conveniently. After calves birth, they should send to the insulation room immediately, feeding colostrum and then go to the calf house after hair dry; in particularly cold time, put on a small vest for the calves^[15]. A new breeding mode can be used too: fermentation bed breeding technology, the technology is for winter calf breeding, it can play a very good insulation effect, and can reduce the amount of litter, can solve environmental problems better to achieve zero emissions, and also saving labor costs^[16].

At temperatures up to 26 to 27 °C, calves produce heat stress. When the temperature is higher than 26 °C, calves begin to sweat, and the increase in respiratory rate and sweating can lead to rapid dehydration of calves, they started to eat less, immune system weakened and elevated body temperature,

these are never good. In addition, calves will consume more energy to reduce body temperature, thereby slowing growth and development^[17]. At this point must take measures to improve calf homes ventilation, calf island shade, to provide free to drink electrolyte solution, increase the frequency of drinking water and milk powder feeding. Zhang Ji Hong thinks that adding certain amount of nicotinic acid, yeast, organic chrome and some chinese herb which can help to reduced heat (such as the use of gypsum, astragalus, codonopsis, atractylodes, white peony root, licorice and so on) into calves' daily food can make the food full of nutrition, and has medical benefits. Crushed it and add into milk or drinking water according to a certain percentage can coordinate the physiological function, reduce the heat stress caused by dysfunction, enhance the adaptability to high temperature, increase the digestion of nutrients absorption and utilization, adjust the immune function, and ease the adverse effects of high temperature and humidity^[18].

Calf Immunization

The development of the calf's immunization program should be based on the actual situation of the breeding area, and there is no fixed pattern. Different areas, different climatic conditions, cattle epidemic situation is different; cattle have a lot of infectious diseases, due to geographical conditions and prevention of different conditions, some cattle infectious diseases in some areas always occur, but not in other areas, the immunization program for the development of bovine epidemics should be developed in accordance with local conditions; the immunization program for cattle should be immunized according to the vaccine provided by the local livestock sector. The local animal husbandry department develops an immunization program based on the epidemic situation of the local cattle epidemic. The implementation of the planned immunization program, such as cattle and foot and mouth disease, is immune to almost all areas, and bovine bruises and bovine insects are not necessarily protected in all areas. Foot and foot disease vaccine, calves should be 10 weeks old (the maternal antibody titer less than 32 times) to vaccinate the first basic immunization, and then at 14 weeks of age, the second basic immunization. After that, vaccinate once every six months to strengthen the immunization^[19]. In the immune process, pay attention to disinfection, one cow one needle to prevent cross-infection.

Calves Deworming

The most common parasitic disease of cattle calves is ascariasis and coccidiosis. Dried roundworm for 7 days use levamisole or benzodiazepic sulfate, with dose of 10 to 15 mg / kg body weight, 1 times / day, and even fed for 2 days, feed when milk feeding. Prevention of coccidia take 10 days and 20 days of each of the cast of a compound sulfamonomethoxine, with dose of 50 mg / kg body weight, 2 times / day, feed once every 2 days, feed drug together with milk feeding^[20].

Calves Clustered

The weaning calves should be divided into groups, and the calves born every 10 days are divided into groups, and the calves before weaning are best kept in the calves' column to prevent them from sucking the umbilical cord, causing the umbilical cord infection. Calves also exist social groups behavior, so, need to rear group by even number of calves, which is more conducive to healthy growth, if read by odd number of calves, there will always be an alone calf. Although the single calf growth up healthy, but its body will not be better than the other pairs of cattle^[21].

Calf Number, Heavy

After calves born for three days, the technical staff determine their physical health determination and select few cows, and marked the ear mark after confirmed. The calves are weighed at birth and are referred to once every six days, so that breastfeeding is carried out according to 15% of their body weight. After birth, a detailed record of calves should be recorded with its coat color, pattern, appearance characteristics, date of birth, pedigree, and etc, which easy to use after breeding^[22].

Calf Management Advice

Calf cultivation is directly related to the body and the milk production capacity of adult dairy cows. Calf body immune system function has not yet fully developed, poor resistance to the external environment, and easily lead to various diseases. So in order to increase the calf survival rate, work personnel must do calf feeding and management work, seriously responsible to provide a comfortable and healthy life to calves.

The biggest difficulty in calf cultivation is the question of the management system. The manager does not know the importance of the calf keeping, they spend most of the feeding and management to

adult dairy cows. To improve the income and make cattle to achieve sustainable development, the most important thing is to start from the calf cultivation. By strengthen the calf feeding and management, the calves cultured into excellent reserve cattle, thus replacing the low milk production, with infertility, blind nipple cows, this not only can save the cost of feed, but also can increase the income of cattle. Strengthen the calf feeding and management, reduce calving incidence, can also save money for veterinary drugs. There is a problem that the work of the staff is not high enthusiasm, less supervised and other issues. The last point is that, in many cases, different sections of the cattle cannot be connected, such as calf feeding and management, perinatal cattle feeding and management separation, the breeding of cows related to the growth performance of the new calves, but many of the workers in the cattle are doing their own.

So cattle managers can develop a more complete management system, the best is to develop reward and punishment system. For example, if the survival rate of calf delivery is 99% and above, staff can get a certain bonus, if less than 95%, staff will get some punishment. For the calf management staff, if the calf survival rate increased, less sick, with less medicine, the daily gain will increased, which can give more bonuses and at the same time, a certain punishment system must be taken if job not perform well.

Conclusion

The use of scientific and rational feeding and management model increase calves lactation and weaning management efforts, which has a great help in the development of China's dairy farming industry. In order to promote long-term stable and sustainable development of the dairy farming industry, there is a need to improve the calf farming technology.

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