YOUNG STOCK
MANAGEMENT
FOREWORD

Young Stock Management is the second in a series of management manuals published by Veepro Holland. Through these manuals Veepro Holland aims at providing you with useful management information. Dairy cattle world-wide need to receive proper guidance to fully utilize their potential.

Veepro Holland hopes that this manual may widen your knowledge about young stock rearing and consequently contribute to further improvement in the rearing results of your herd.

Appreciation is due to everyone who contributed to this manual, especially Dr. Maarten Pieterse of the Department of Herd Health Management and Reproduction of the Faculty of Veterinary Medicine, University of Utrecht, and Ing. Tjeerd Boxem of the Research Station for Animal Husbandry at Lelystad, for their encouragement and constructive criticism.

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Veepro Holland
INTRODUCTION

Young stock rearing is an important part of dairy farming. Here the foundation is laid for the high-yielding dairy cow of the future. Young stock rearing has proven to be of great influence on future performance.

Well-developed heifers can be inseminated at an early age.

The purpose of rearing young stock is to raise well-developed heifers, able to calve at an early age, without calving difficulties. The advantages of calving at an early age are lower rearing costs, early productivity and consequently a higher life-time milk production, thus making the cows more profitable.

For the prevention of calving difficulties it is essential that the heifers are well-developed. The optimal time for first insemination of a heifer depends more on body-weight than on age. Some heifers achieve the desired weight at about 14 months, whereas others do not reach it before 16 months of age. Therefore, the proper age for insemination and consequently for calving is determined by the development of the heifer. Through good young stock rearing it is possible to inseminate the heifers at an average age of about 14-15 months, which results in an average age at calving of about 24 months.

THE FIRST DAYS

Hygiene

Good calf rearing starts before the calf is born. A hygienic environment during the birth process is essential to prevent rearing diseases, such as scour. Clean hands and disinfected birth-ropes are necessary as well as a clean and disinfected calving pen. The calving pen should never be used for sick cows.

The first stage after a calf is born is one of the most important periods. Immediately after the calf is born the navel must be disinfected with an iodine solution, which should be repeated the following day. The calf should be rubbed dry with clean straw or a clean towel to stimulate blood circulation. If a calf coughs up mucus it should immediately be lifted up by its rear legs to ensure the release of the mucus from its bronchial tubes.

The first few months in a calf’s life are much more important than most people realise. Proper attention should be paid to the rearing of young calves and no details should be overlooked. Therefore, the person in charge of calf rearing has one of the most responsible jobs on the farm. He or she must be fully aware of this responsibility to get the highest possible results.
Feeding of colostrum

A newly born calf does not have antibodies for protection against diseases and therefore depends entirely on its mother’s colostrum for protection. For this reason, it is essential that the calf receives about 1-2 litres of colostrum in stages from its own mother within half an hour after its birth. If no colostrum is available from the mother, colostrum from another freshly calved older cow should be used. In case there is no other freshly calved cow available, it is advisable to store some colostrum in the freezer. Feeding of colostrum must continue for at least three days after birth and should be done about 3 to 4 times daily. With each feeding about 1½-2 litres should be given.

It is essential that the calf receives some colostrum directly after it is born.

Especially during the first three days of its life it is essential to observe the calf closely to convince yourself that it is drinking sufficient colostrum.

Feeding with a rubber teat

The colostrum can also be fed in a bucket or a bottle fitted with a rubber teat. In this way the calf will get used straight-away to this method of drinking. The colostrum must be fed at body-temperature and the bucket should be held high enough for ease of drinking. This stimulates the digestion and consequently the absorption of nutrients in the blood. The advantages of this method are that the intake of colostrum can be properly controlled and that the amount of work and space needed is lower, as is the chance of contamination.

It is an absolute must to thoroughly clean and disinfect the buckets or feeding bottles and rubber teats before and after each feeding, as otherwise they can be a source of contamination.

Bucket feeding

The calf is taught to drink out of a bucket by pushing its mouth into the milk. Advantages of feeding the milk from a bucket are that the bucket is easy to clean and that it is easier to change over from milk feeding to water.

Clean buckets are essential.

Leaving the calf with its mother

It is possible to leave a newly born calf with its mother for the first 12-24 hours to allow sucking. An advantage of this method is that the milk is always at body temperature. However, a disadvantage is that you may have difficulties controlling the intake of colostrum and there will be a considerable chance of contamination.

The calf should be transferred to an individual calf pen or crate.
THE MILK PERIOD

Whole milk or milk replacer

Three days after birth there can be a gradual change to twice daily feeding of whole milk or milk replacer. Whole milk with a fat content of about 4% can be fed to an amount of 4-5 litres per day during the first month. Milk replacer has a lower fat content of about 2% and should be fed at a rate of 5-6 litres per day. Every day feeding of milk should be done at regular intervals. When the calf is about four weeks of age, the amount of milk may gradually be decreased to about 2-3 litres per day at the age of two months.

Ideally, milk should always be fed at body temperature. However, daily variations in the temperature of heated milk may cause more digestive disorders than cool milk.

Concentrates

Together with roughage a handful of palatable concentrates of at least 16% digestible crude protein (calf starter pellets) should be supplied as an appetizer from the first week onwards. Let the calves get used to eating concentrates by placing a handful of pellets against their mouths after milk has been fed. They will lick the pellets and soon they will be eating concentrates. Gradually increase the amount of concentrates to about 1 kg per day after a period of six weeks. Afterwards the amount can be further increased to about 1½ kg per day.

High-quality roughage

From the first week onwards the calves should have access to high-quality roughage, such as excellent hay or high dry matter grass silage. This is important to stimulate the development of the rumen at an early age. High-quality roughage should always be available at free choice. The feeding of hay in a rack will keep it clean, which is important for the prevention of diseases.

High-quality roughage stimulates rumen development.

Water

If the supply of milk is gradually decreased, the calf will step-by-step drink more water. Water is indispensable and should be available ad lib, especially in places with high ambient temperatures. Water should be withdrawn from the calves about one hour before milk feeding and returned about two hours afterwards in order to encourage dry matter intake.
Do not feed more concentrates than the calf will eat within one day. A large accumulation of concentrates in the trough may become unpalatable and will discourage the calf from eating. Never leave old feedstuffs behind in the trough or buckets. They will get mouldy and become a source of contamination.

The calf starter concentrates should be replaced by palatable weaner pellets with a digestible crude protein content of 14-15% and the amount should gradually be increased to about 2 kg per day. Continue feeding high quality grass silage or hay. Wet and fresh grass should not be fed during the first six months.

WEANING

Weaning can take place at the age of about 2-2½ months or, better still, when the calves are weighing about 75 kgs and they are eating about 1 kg of concentrates per day. During the last week before weaning gradually reduce milk feeding to once per day. It takes a master’s eye to correctly judge the stage of weaning. When a calf has been suffering from an illness you should postpone weaning until the calf has fully recovered.

FROM WEANING TO CALVING

Recommended growth rates

Once a calf has been weaned, the risky period of calf diseases and possible mortality should have passed. The expensive period of feeding has lapsed and the emphasis can now be shifted to a ration resulting in the recommended rates of growth. These rates of growth are shown in table 1. The aim is to achieve a live-weight of about 510-550 kgs after first calving.
Feeding

If good quality roughage is fed, it is not necessary to feed concentrates when the calves are over nine months of age. When the roughage is of poor quality (e.g. straw), concentrates will still be needed to meet the nutritional requirements for growth and maintenance. A guideline in this case can be 1 kg of concentrates as a basis + 1 kg per 100 kgs of body-weight. If the feeding of concentrates is stopped, one should find out if the animal receives sufficient minerals. Otherwise a mixture of minerals must be fed as a supplement to the ration. It is not advisable to feed a large proportion of maize silage. The animals might become over-conditioned (fat). This can easily happen with young stock over one year of age. It may cause calving difficulties as well as fattening of the tissue of the udder, which has a negative effect on the quality of the udder around calving.

Good quality roughage remains important.

Monitoring growth rates

Besides weighing is measuring of the chest-size another method to monitor the rate of growth. The animals are measured behind the shoulder with a measuring tape. There is a relation between chest-size and body weight as is shown in table 2.

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Insemination

Breeding heifers should start when they have reached a live-weight of about 350 kg. This will be at an age of about 14-15 months if the recommended rates of growth have been achieved.
It is very important to select a proven sire which is known for its ease of calving. Natural service by a young unproven sire may look convenient when the heifers are grazing in paddocks far away from the farm facilities. However, the breeding performance of unproven sires is unknown. They may also cause calving difficulties, which may result in less viable calves. On top of this calving difficulties may lead to extra difficulties in getting the freshly calved heifer pregnant again and could result in a lower milk production.

**IDENTIFICATION**

A good identification system is necessary for proper young stock management to be able to keep accurate records of the young stock. Any marking for temporary or permanent identification should be done accurately at an early age, preferably just after birth. Permanent identification may include photographing or sketching the young calf for herdbook registration and for your own farm records. Furthermore, you can apply eartags or freeze branding for quick identification of the animal.

**Eartagging**

Nowadays the plastic eartags are very popular. They are available preprinted with numbers or as blanks. In the Netherlands there is a nation-wide system in which every calf, bull or cow has eartags with its own unique life-time number. If blanks are used, you can write your own information, e.g. sire, date of birth and number of the heifer calf with a special tag pen.

Eartagging is a good method of identification.

The tag must be inserted in the middle of the ear between the muscular tissue. The eartag should be large enough to be read from a distance of at least 10 metres. The eartag should preferably be yellow with the information in black water-proof ink.

**Freeze branding**

Freeze branding, either with dry ice and alcohol or with liquid nitrogen destroys the pigmentation of the black skin and new white hair will grow. The method is rather painless and the markings are easy to read from a distance. It is a good method of identification in combination with a numbered collar.

**HOUSING**

**Individual housing**

Preferably young calves should be individually housed for about 3 weeks, because they tend to suck each other. This sucking allows easy transmission of diseases. Calfcrates, pens or movable hutches can be used for individual housing. The housing should be constructed in such a way that the calf gets enough fresh air without draft and good protection from cold winds and rain.
Rotational grazing

Rotational grazing may help to eliminate parasites. Frequent moving of young stock to new paddocks helps to get heavier animals. Parasites never disappear completely. Pasture rotation simply supplies the young stock with new and fresh roughage and the effect of contamination with parasites will be reduced through good nutrition. The young stock will build up better resistance to infection with parasites.

Group housing

After this period of individual housing the calves can be housed in groups of 3-5 calves per pen, preferably on straw bedding. The individual pens used should now be cleaned, disinfected and, if possible, left empty for at least a week. It is also possible to house the calves in a cubicle housing system with a slatted floor. It is important that there is enough space for each animal and that the cubicles are dry and comfortable to lie down.

The calves feel comfortable in a dry and clean straw bedding.

GRAZING

Grazing good quality grass can contribute to good growth. Young stock grazing in pastures will be infested with endoparasites. It is of great importance to ensure that the infestation will be only moderate. In this way the young stock will build up enough resistance to parasites and no growth problems will occur.

Good results have been achieved by grazing young stock ahead of the milking cows in pastures that have been mown since the last grazing. These good results come from quality pastures and from less contamination of the grass by worms and larvae. The young stock should never graze after the cows, because of a much greater risk of severe infestation.

HEALTH

Good health is essential for achieving the recommended rates of growth. Herd health management and disease prevention play an important role in controlling any outbreak of diseases. The prevention and treatment of the most frequent rearing diseases will be discussed.
Scour

Scour can easily be identified. The dung is liquid, it has a whitish colour and a strong smell. The calf has a dull appearance and drinks slowly or refuses to drink at all.

Good hygiene keeps a calf healthy.

Prevention
Rule number one for the prevention of scour is optimal hygiene. This will avoid a lot of unnecessary trouble. If you are really facing problems with scourings, then a vaccination programme of pregnant cows, six to two weeks before calving, assists in preventing calf scourings.

Treatment
When scour appears an electrolyte suspension should be fed until it ceases. Milk feeding should not be stopped for too long. Two to four times a day, half a litre of milk can be fed next to the electrolyte suspension. If everything goes well the amount and frequency of milk feeding can be gradually increased.

When the scour is caused by nutrition it will disappear after 2 days. If no improvement is noticed after 2 days the scour might have been caused by bacteria, and treatment with a broad spectrum antibiotic should be applied. If there are often problems with scourings a veterinarian should be consulted to find the cause of the disease.

Respiratory diseases

Non-optimal growth and calf mortality during the first four months are mainly caused by respiratory infections, such as pneumonia. Typical symptoms of pneumonia are coughing, a high fever, watery eyes and mucus running from the nose.

Prevention
Respiratory diseases mostly occur between the second and the fourth months of the calf’s life. By that time the antibodies from the colostrum have disappeared.

Prevention
Feeding of colostrum and clean housing with good ventilation can prevent most of the problems. Good ventilation will decrease the pressure of infection by constantly supplying fresh air. This is a necessity in the prevention of respiratory diseases. To prevent the spread of respiratory diseases it is advisable to house the yearlings and young calves separately. Vaccination of calves over three months of age against one or more respiratory diseases is recommended. It will certainly give a better protection to the young stock.

Treatment
If an animal is suffering from pneumonia, the treatment should be focussed on the prevention of secondary bacterial infections. A treatment with antibiotics for at least five days will be successful in most cases.
Your veterinarian can advise you on the best possible treatment. A good health record with close monitoring of the young stock is very important for early detection of any health problems.

**External parasites**

**Prevention**
External parasites and skin diseases, like mange, lice, ringworm and warts can be prevented through good hygiene, ventilation, and shaving of all young stock before housing. It is recommended to isolate the infected young stock. The only sure way of ringworm prevention is to avoid contact with infected animals. The housing may also be a carrier for parasites. Under all circumstances overcrowding must be avoided. It is recommended to clean and thoroughly disinfect the young stock pens after the animals have been moved outside.

**Internal parasites**

Even with good management internal parasites have to be controlled. Regular deworming is needed when the dung samples contain a too high level of parasite eggs. This should start at the age of 2 months and be repeated every 3 months.

**Vaccinations**

You should consult your veterinarian about a vaccination programme for your young stock against diseases like Foot and mouth disease, Black-Quarter, Anthrax and Brucellosis.

**DEHORNING**

The purpose of dehorning is to eliminate the risk of injury to other animals and to people working with the herd. Dehorning should preferably be done at the age of about 3-4 weeks, when the horn bud is felt. This has certain advantages over dehorning at an older age, such as: less work, no decreasing feed consumption and no reduced growth and moreover it will give better results. The base of the horn should be anaesthetised. The clipping of hair around the horn will make the dehorning job easier.

Dehorning can be done with a specially designed round iron.

**Treatment**

A number of anthelmintics are very effective in eliminating an infestation with mange and lice. Warts can be controlled with an injection of Anthiomaline. Ringworm can be eliminated by painting the infected lesions with a copperbased chemical or a mixture of diesel oil and creosote. Nowadays effective drugs are also available. In all cases consult your veterinarian for the best treatment against parasites and skin diseases.
Round iron

The best method for dehorning is to use a specially designed round iron which is made red hot. The tool should be pushed and turned round on the horn until a white edge can be seen. It is important that this is not done too deep. Overdoing may cause brain damage. It requires about 10-20 seconds, depending on the thickness of the skin. After the dehorning the horn pit should be sprayed with gentian-violet to prevent possible infections.

REMOVING EXTRA TEATS

The removal of extra teats can be performed with a pair of sharp curved scissors after thoroughly cleaning and disinfecting the place on the udder. Apply tincture of iodine or gentian-violet to control infections.

The best time to remove extra teats is together with the dehorning. In case of doubt, it is advisable to wait until the calves are older. When this minor operation is done properly there will be very little bleeding and the scar will hardly be visible at calving.

SUMMARY

Improvement of young stock rearing will result in a lower average age at first calving. This means less rearing costs with an earlier profitability and a higher life-time milk production. Therefore, good young stock rearing is the basis for economic dairy farming. Well-developed heifers will be able to calve at an age of about 2 years.

The emphasis in rearing young stock should be placed upon nutrition in order to achieve the recommended rates of growth and the prevention of rearing diseases.

The basic guidelines for good young stock rearing are:

1. High hygienic standards at birth ensures the calf a good start;
2. Colostrum must be fed directly after birth and should be continued for at least three days, several times a day;
3. Calves should be housed individually for about 3 weeks;
4. Good identification is of utmost importance;
feeding of whole milk or milk replacer should be gradually decreased and accordingly, the intake of good quality roughage, concentrates and water should be increased;

calves should be weaned at an age of 2 - 2½ months;

after weaning, feeding of high quality roughage remains important in order to achieve the recommended rates of growth;

clean and properly ventilated housing is very important in the prevention of scour and respiratory diseases;

pasture rotation will result in good growth and only a moderate infestation with internal parasites;

inseminate the maiden heifers at a body-weight of about 350 kgs with semen of a proven sire, which is known for its ease of calving.

REFERENCES FOR FURTHER READING

- Calf rearing, Lecture notes by Dairy Training Centre ‘Friesland’.
- Calf and heifer rearing, Dairy Handbook, NADF of Zimbabwe.
- Rearing of Calves and Heifers, and Ruminant Digestion, Lecture Notes FAO Dairy Training School, Kenya.
- A Veterinary Book for Dairy Farmers, Roger Blowey, Farming Press.
- The complete practical handbook for cattle farmers, Dr. P.A. Gilbert-Green, Zimbabwe.
Dairy Training Centre Friesland (DTC-Friesland) is established by various Dutch farmers’ organisations and controlled by the Ministry of Agriculture. The Centre conducts a variety of international training-programmes and courses. We also provide consultancy and management services.

All courses have a strong practice-oriented character based on the training concept of **learning by doing.** The practical training is very intensive; one instructor deals with groups of six students and for subjects like milking even with three students only. DTC-Friesland offers training in the following subjects:

- **Dairy Husbandry**
  * machine-and handmilking, milking machines, milk hygiene
  * feeding, ration-calculation, feedplans, quality of feedstuffs
  * fertility management, heat detection
  * breeding, use of A.I., culling, body conformation
  * housing, tying/cubicle systems, hygiene
  * health, mastitis control, hoofcare
  * calfrearing
  * farm economics
  * farm administration

- **Forage production**
  * pasture management
  * foddercrops
  * silage making
  * farm machinery

- **Milk processing**
  * manufacture of cheese, butter, yoghurt, ice-cream, etc.
  * milk collection and payment systems
  * marketing
  * management of a dairy unit

- **Sheep-husbandry**
- **Dairy goat husbandry**
- **Intensive beef-production**
- **Horse-keeping and animal traction**
- **Teaching-methodology**

Visits to farmers organizations, A.I.-stations, Health and Extension service etc. are integrated in the courses to provide a good picture of the dairy sector in the Netherlands.
AD HOC COURSES
Our major activity is the organization of ad hoc courses on request, preferably for groups of a multiple of six participants. These training programmes are tailor-made and completely designed according to the requirements of the client. The courses deal with one or more of the earlier mentioned subjects. Duration of the courses varies from 1 week to several months.
The courses are conducted in English. For some special subjects training can be provided in French, Spanish or German as well.
If facilities are available locally, our staff is prepared to conduct courses abroad as well.

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This course is especially designed for persons in charge of a large-scale dairy enterprise, and includes all aspects involved in managing a dairy herd. The course offers a good opportunity to refresh one’s knowledge and learn about recent developments in dairy-farm management. The course is conducted annually in September/October.
However, for groups of at least six persons it can be organized at any time during the year.

TRAINING FACILITIES AND STAFF
The centre has four farms, each with a different management system. One farm is especially equipped for international courses. The total stock at the four farms includes 250 dairy cows, 50 fattening-bulls, 45 dairy-goats, 85 sheep and 12 Friesian horses. Additionally, the centre maintains close relations with twenty neighbouring farms which are used for practical training.
Our staff consists of fifty dedicated and well-qualified trainers.
All have up-to-date knowledge of modern dairy-farm management, and over 70 man-years experience is present in various dairy development projects throughout the world.

ACCOMMODATION
A newly constructed hostel provides full board and lodging in single or double bedrooms. The hostel provides an international kitchen, and many recreational facilities. Social excursions are organised during the weekends to enable the students to get acquainted with the Dutch culture.

For more detailed information on the activities of DTC Friesland, please contact:

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