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USER GUIDE ON DAIRY HUSBANDRY

Ministry of Agriculture, Animal Industry and Fisheries

National Agricultural Advisory Services
DAIRY HUSBANDRY

Milk provides relatively quick returns for small-scale livestock keepers. It is a balanced, nutritious food that is important to household food security in many rural economies. Milk and dairy products play an important role in human nutrition and contribute to economic development. To plan for improved dairy production, advisers and extension staff need to help farmers in ways that will be technically feasible, socially acceptable and economically viable. Milk is produced in extensive, semi-intensive or fully intensive systems. Smallholders produce the vast majority of milk in developing countries where by 2025; demand is expected to increase by 25 percent. In each of these systems, there are constraints which limit milk production and these may be environmental, social, economic, marketing, technical, husbandry, management, biological and genetic constraints. The degree to which constraints can be overcome depends on the farmer’s knowledge and ability and the capital available for investment.

1. Breeds of Dairy cattle

<table>
<thead>
<tr>
<th>Breed</th>
<th>Characteristics</th>
<th>Average milk yield in litres (305 day lactation)</th>
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</thead>
<tbody>
<tr>
<td>Friesian</td>
<td>Good dairy breed, but also ideal for beef. Heavy animals; 500-600kg liveweight. Highest milk producer. Black and white. Demands very good management</td>
<td>3825</td>
</tr>
<tr>
<td>Jersey</td>
<td>Average 350 kg body weight. Hardy animal. Early maturing. Brown colour normally. Bulls can be blackish in colour. Produces concentrated milk. Eats less than the Friesian, and adapts well to hot climate.</td>
<td>2970</td>
</tr>
</tbody>
</table>
Ayrshire

Colour is light to deep cherry – brown or combination of these colours. Very efficient grazer.

Guernsey

Milk production is between Friesian and Jersey. The colour is brown with white markings. Milk quality is good (concentrated).

2. Calf rearing

In any dairy enterprise, calf care is of utmost importance, as these young animals represent the future of not only the herd, but also the farmer’s dairy enterprise. The five pillars of calf rearing should therefore be remembered:

a) Cleanliness

Calves must be born and raised in a clean environment. Dry clean bedding and clean floors are essential for healthy living. Cement or concrete floors
are preferable, as they are easier to clean. Long-cut or baled straw make good bedding and fresh straw should be added daily. Whatever bedding is chosen, it should absorb moisture, and should never be wet or too soft. Always feed calves from clean bottles and buckets. Steel buckets are preferred to plastics. Sanitise buckets and bottles by scrubbing regularly with a brush.

b) Colostrum

Colostrum is the foundation of all calf feed and it protects the calf against disease. The calf has to receive colostrum within one hour of its birth, and another two to four litres 12 hours later. The colostrum contains essential antibodies, vitamins and proteins that the calf needs for sound growth and protection against disease. Colostrum provides the calf with the needed immunity for the first few weeks of life. After that it is important to follow the recommended vaccination programme to protect the calf against future diseases. (Consult veterinarian).

c) Consistency

Be sure to feed calves everyday at the same time, and always give milk at the same temperature. Do not switch between cold and warm milk, as this might make the calf sick. If at all possible, your calves should be handled by only one person who should know the calves very well.

d) Calories

From the second and third day after birth, the calf must be fed milk from the cow. Give two litres in the morning and two in the evening. Start your calf on calf-starter or pellets on day four, and feed the pellets or starter meal twice per day. Start weaning your calf off milk when it is six to eight weeks old. Start weaning when the calf consumes half a kilogram of starter meal every day. The milk should be decreased gradually over a period of ten to 12 weeks. Some rules for weaning your calf:

- Always supply fresh, clean water and replace it twice per day
- Supply good quality hay, as this is good for the development of the rumen muscle
- Start giving vitamin A, D and E supplements two weeks before weaning
- Do not castrate or dehorn calves during the weaning period
- Move the calves to their new pens approximately one week after they have been weaned.

e) Comfort

Calves that are comfortable, can use their energy to grow big and strong. Comfort refers to dry bedding and proper calf housing. Whatever the type of
housing you choose, always follow these basic guidelines:

- Always make sure that the housing is well-ventilated, draught-free and well-lit
- Always separate calves from older cattle
- Housing should always be clean and dry
- Calves should have easy access to feed and water
- Do not mix the feed in the pens and store the feed in a separate location away from the housing.

Common diseases of calves are; navel ill, calf scours, helminthes (worm infestation) and calf pneumonia.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Clinical signs</th>
<th>Management</th>
</tr>
</thead>
</table>
| Navel ill (joint ill) | • Umbilical region inflamed  
                                • Joints swell                                                                 | • Dress umbilicus with antiseptic at birth  
                                                                                      • Maintain good hygiene at parturition |
| Calf scours (Calf diarrhea)  | • Dirty tail,  
                                • Diarrhoea (which may contain blood),  
                                • Loses weight  
                                • Moves slowly                                                                | • Firstly treat the diarrhea  
                                                                                      • Rehydrate the calf with fluids with electrolytes and nutrients.  
                                                                                      • Give only clean water and do not give milk or starter meal.  
                                                                                      • Contact a veterinarian. |
| Helminths       | • Poor body condition  
                                • Starring coat  
                                • Pot belly                                                               | • De-worm calves regularly particularly at beginning of the rains  
                                                                                      • Use recommended de-wormers (consult veterinarian) |
| Calf pneumonia  | • Sneezing and coughing  
                                • Difficult breathing                                                          | • Provide clean, airy and uncrowded conditions |
3.0 Heifer rearing

Female calves after weaning are called heifers. From about 150 days, management depends on the system and season of birth.

**Calves born in wet season**
- Calves born in the wet season will enter the dry season at about 5 months of age.
- Calves in extensive systems should receive supplementation such as maize or sorghum bran in addition to natural pasture.
- Concentrate (3-5kg) should be adjusted according to heifer growth and condition to maintain steady growth.
- Feed precalving heifer well to receive the equivalent of 5.5kg concentrate and 10 kg fresh cut grass or 23 kg silage daily.

**Calves born in dry season**
- Calves born in the dry season will attain an age of up to 5 months before the wet season.
- Supplementary hay and concentrate should be given in dry season.
- When wet season sets in feed as above.

4.0 Adolescence

- Maturity in ruminants is weight dependant as well as age dependant.
- The onset of puberty (when oestrus cycle begins) in heifers depends on weight and rate of growth.
- Exotic animals reach maturity earlier at (40% mature weight) and indigenous animals later at (60% mature weight).
- Target weights for first service depend on breed, but should be higher than that at which the heifer achieves puberty and first oestrus. The range and variation of this depend on management and nutritional levels.
- A low age at first calving is desirable because it reduces land and forage requirements for replacement stock and reduces overall maintenance costs.
for young stock. It also leads to faster genetic improvement as cow will have more calves in its lifetime.

5.0 The Mature Dairy Cow

5.1 General Guidelines

- The duration of lactation depends on age, breed, and feeding but generally for a first calver it lasts 8-10 months but for adult heavy milkers it may go up to one year.
- The average daily milk yield for exotic animals varies from 9-60 litres in commercial milk production herds.
- Cows do not yield an equal amount of milk daily throughout the whole of the lactation period. For the first 6-12 weeks amount steadily increases to peak then may be steady for days up to 2 weeks after which it steadily falls upto end of lactation.
- Natural cow’s milk contains a butter-fat content ranging from 3-6%. Indigenous cows have the highest butter fat content.
- Generally, the higher the milk yield, the less the butter-fat content is likely to be.

Milking

Dairy cows are usually milked twice a day, high milkers may be milked thrice. As far as it is practical, the intervals between successive milkings should be the same.
- Before commencing milking the cow’s udder must be washed with a disinfectant solution and then dried with a clean cloth.
- The milkers must wash their hands thoroughly with warm water using soap, rinse in clean water, soak in disinfectant solution and dry with clean cloth.
- At commencement of milking, use a “strip cup” where the first “fore” milk is drawn and examined for any abnormalities. This milk is discarded because
it normally contains micro-organisms from the teat canal. **Never milk the fore milk on the floor of the dairy.**

- Milking must be carried out quietly, speedily and efficiently.
- Each udder should be thoroughly stripped as this stimulates more milk production and secondly, the “strippings” or last milk in the udder is the richest in butter fat.
- After milking, the milk should be cooled to as low a temperature as possible at the farm.
- As far as possible the milker should wear suitable attire including overall, or apron and cap.
- After milking, the utensils and milking stools must be kept scrupulously clean and kept in a clean place.
- In general, cows on good ley pastures (planted grasses and legumes) will obtain a maintenance ration plus 4.5 Kg of milk.
- Any additional Kg of milk will require supplementary feeding of 1 Kg of compounded dairy meal.
- A cow requires a very liberal supply of water. On average 5 litres of water is necessary for each litre of milk secreted.

**Drying off**

- Reduce the number of milkings to one daily
- Curtail her rations for 7-10 days.
- Then milk every other day
- Do not strip for about 14 days.
- Dry her off 6-8 weeks before she is due to calving again.

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1.2 **Management of Bulls**

a) A well managed bull can stay functional in a herd for 8-10 years.

b) Allow a young bull to serve when it is 12-15 months of age up to 20 heifers.
in its first season.

c) Later it can serve 30-60 cows annually depending on age, fertility and its physical fitness.

d) On good ley pasture, a mature bull requires 2-4kgs of concentrate per day.

e) Exercise is necessary to maintain muscular tone and activity and to prevent excessive fatness and flabbiness.

1.3 Zero grazing

Zero grazing also called “stall feeding” is an intensive dairy production system in which cattle do not graze, but are confined in a shed or stall where feed and water are brought to them.

Advantages of zero grazing

- You can keep more cattle per unit area of land (higher stocking rate). This is achieved by growing high yielding fodder crops such as Elephant grass, Guatemala, Giant Setaria and Lablab.
- You can utilize forage from area not accessible for grazing such as roadsides and steep slopes.
- The cattle are less exposed to environment hazards such as diseases and heat stress.
- The cows conserve the energy that is usually wasted in moving during grazing turning it into more milk and meat production.
- The manure can be collected easily.

Important points to note

(i) Zero grazing is labour intensive. The feed and water must be taken to the cow in the shed. However, you save time as you don’t need to herd the cows.

(ii) You require capital for fodder establishment, construction, equipment and buying quality cows.

(iii) You have to ensure that there is enough feed all the time. Here you need to plan properly before you start.

Steps in managing dairy cattle under zero grazing

a) Establish a fodder bank

The first thing should be to establish a fodder bank by growing Elephant grass, or Giant setaria. This should be supplemented with legumes such as Lablab. You should plant at least one acre of fodder per cow.
b) Construct the zero grazing unit
The basic parts of the unit include: cubicles (resting areas), the walking area, feed and water troughs, the roof, and the milking place. Others include the calf pen, store, fodder chopping area, manure storage, holding crush and water tank.

c) Choose the right cow
It is important that you choose a cow that will be profitable under the available resources on the farm. If the management is good and you have a good supply of fodder and other feeds, a pure exotic heavy producer such as a Friesian is suitable. If the fodder acreage is small and the climate hot, choose smaller hardy breed such as Jersey or Guernsey, or crosses of exotics with local breeds. In general, cows producing less than 10 litres per day are uneconomical for zero grazing.

d) Give the cow the right feed
Ensure that your cow is given as much fodder as it wants to eat i.e. a mixture of grass and legumes in a ratio of 3 parts of grass to 1 part of legumes. In case of elephant grass, it should be harvested when it is 60 to 90 cm (2 to 3 ft) and chopped into small pieces 2 to 5 cm long. Supplementary feeds such as concentrates should be given to cows
producing more than 8 litres of milk. Other feeds include garden wastes such as potato vines, maize stover, banana peels and agro-industrial by products such as maize, rice or wheat bran or brewer’s waste. Give the cow mineral supplements in form of licks or powder mixed with any of the feeds mentioned above.

Cutting napier grass.

e) Other important activities
To ensure profitability of the enterprise, you should also pay special attention to the following:

- Control of diseases and parasites to minimize deaths and other economic losses
- Proper milking and milking hygiene
- Appropriate breeding methods such as artificial insemination
- Keep records on: production, health, sales and purchases- to help you in planning and decision making.
- Ensure environmental protection for sustainable production
- Good calf rearing for replacement stock
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National Agricultural Advisory Services (NAADS). Plot 5, Kyadondo Road, Legacy Towers Block B, Nakasero. Tel: 256-414/312-345440/345065/345066/345060, Fax:256-414-347843. Email: info@naads.or.ug