

CATTLE MANAGEMENT IN ABKHAZIA

an introductory guide



This publication is available in English and Russian.

Main author, layout and graphics: Ryan Sherman, AAH ARD Project Officer

Contributing authors: Aleksandar Dodovski, Amina Gindia, and Paul Hoare.

Chief Editor: Paul Hoare, AAH Communications Officer

Russian Translation: Amina Gindia, AAH Dissemination Officer

Animal Husbandry Consultant: Aleksandar Dodovski, Ss. Cyril and Methodius University in Skopje, Faculty of Veterinary Medicine, Skopje, Macedonia

This document was produced in the context of a project funded by the Austrian Development Agency/the Austrian Development Cooperation. The responsibility of the content of this booklet lies entirely with the authors; the information and views expressed do not reflect the official opinion of the Austrian Development Agency/the Austrian Development Cooperation.

Cover photo from Pixabay under Creative Commons Non-Commercial license

CONTENTS

Introduction	3
Housing for Cattle	5
Feed and Water Management	13
Milking Hygiene	17
Fertility Management	23

Introduction

Abkhazia is an ideal setting for cattle farming. Large open pastures and rich vegetation offer farmers the opportunity to engage in a low-input, high-output agricultural activity which in turn provides families a source of income and nutritious food. Cattle able to graze freely year round boast a much higher welfare status than their housed and intensively-farmed counterparts. They are generally healthier and less prone to disease, and this in turn improves meat and dairy production.

Thanks to these ideal conditions, farmers in Abkhazia are able to improve cattle production systems with relatively low effort. Many constraints can be overcome simply by implementing the principles of good herd management. The best practices presented in this booklet focus on improving feed and water management, upgrading cattle

housing, maintaining milking hygiene, and enhancing animal welfare.

Action Against Hunger South Caucasus has been active in Abkhazia since 1994 and has made agricultural extension and development a primary focus. It currently operates three agricultural training centres, livestock demonstration plots, a pest monitoring and management system, and is supporting the veterinary sector to improve its prevention, diagnostic and treatment capacities.

This booklet is produced as part of these broader efforts to improve agricultural practices within Abkhazia and has been made possible with funding from the Austrian Development Corporation (ADC). The content has been created by Action Against Hunger staff in consultation with international and local cattle husbandry experts.

This booklet is intended to be a short, introductory guide, where topics are presented in a brief and elemental form. Farmers wishing to improve their livestock operations are encouraged to consult the master farmers trained under the ADC-supported project and to visit our demonstration farms.

We hope that this booklet will prove to be useful to livestock farmers of Abkhazia. Finally, we would like to thank all those involved at every level of this project for their hard work, dedication and cooperation. Our work would not be possible without your support.

Ryan Sherman
ARD Project Officer
Action Against Hunger
South Caucasus Mission
February 2020



1. HOUSING FOR CATTLE

Animal housing should be designed with two objectives in mind. First, housing should provide comfortable shelter for animals. Second, it should ensure ease of management for handlers.

The best cowsheds take into account cows' natural preferences for temperature, physical space, and daily patterns of sleeping, eating, moving, relaxing and drinking. Passageways and resting areas should be designed so that cows do not get in each others' ways during their daily activities.

Cowsheds should also facilitate farmer operations, such as milking routines, and cleaning, and providing feed and water. A well-designed cowshed will enable a farmer to complete all tasks in a timely and orderly manner.

Farmers the world-over have developed many different housing systems for cows. The housing systems most relevant to the Abkhazia context are loose housing and free stall housing. **Loose housing** allows cows to walk around freely and share all areas within a housing structure. **Free stall housing** is like loose housing, but each cow is also allotted a stall which she may enter or leave at will. Each of these housing systems are discussed in detail below.



Cows should be able to go about their daily activities without getting in each others' ways. (Image source: pixabay)



A well-designed cowshed simplifies everyday farm operations for both farmers and animals. (Image source: pixabay)

1.1 Good Planning

The cow housing system should take into account the climactic conditions of the area. When selecting the site of the cow shed, the following factors should be considered:

- Soil conditions
- Drainage
- Water supply
- Wind direction
- Angle to the sun
- Electricity supply

The shed should be on higher ground with a slight slope to allow for good drainage to reduce standing water and mud.

Abkhazian winters are not challenging for cattle, but in summer cattle may become overheated and will be reluctant to enter the shed. Cow sheds should therefore be designed with open sides to allow for plenty ventilation and so as to not trap heat or gasses inside.

Open sides must be well designed to take into account wind and sunlight. The length of the cow shed should be oriented along the east-west axis (see diagram 1) to ensure the sun travels directly overhead the entire length.

This orientation will reduce direct sunlight on cows in the shed while drying the area around both sides of the cowshed. Ideally, this orientation will also take advantage of dominant north to south winds in Abkhazia which should hit the length of the shed. If arranged this way, moving air will travel a shorter distances before exiting the other side of the shed thus improving the freshness of the air inside.

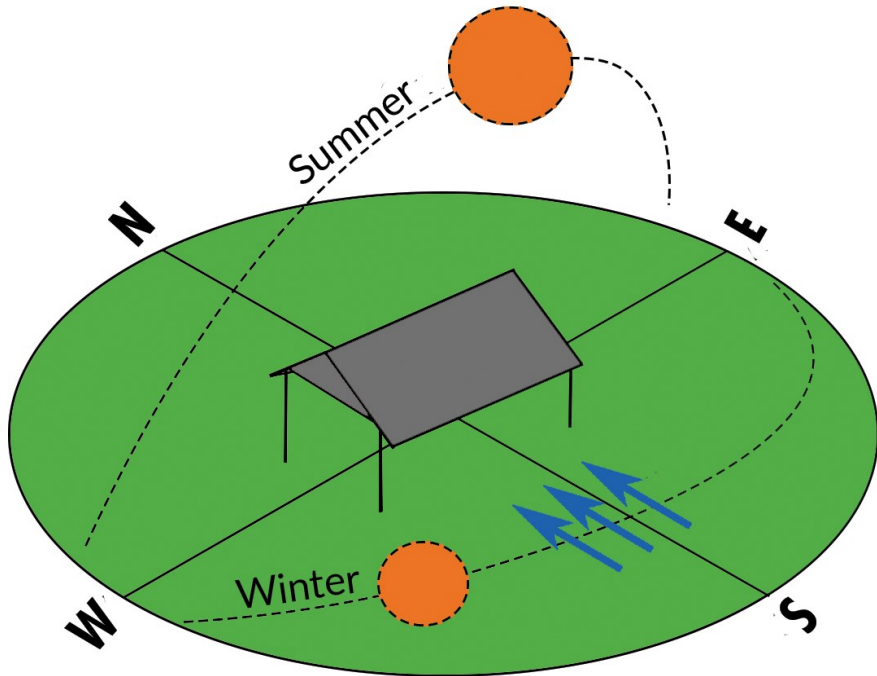


Diagram 1. Cow sheds should take into account the sun's path across the sky and the direction of the wind. Air circulation within the shed will be improved if wind hits the long side of the shed. In the Abkhazia context, orientating the length of the shed on the east-west axis will generally expose the long side of the shed to wind while providing better shade during the day.

1.2 Overview of Cattle Housing

The roof of a cowshed should be A-framed and the total area must be wider than the total floor area of the shed to prevent runoff from roof from flooding the shed. The ceiling should be high enough to allow sufficient air movement and air volume inside. Stale, gassy air is highly unpleasant for cows. Cows will be reluctant to enter a shed if they find the climate inside disagreeable.

The location of the water troughs should be close to the feeding area and entrance to the shed, but they must not block the free movement of cow traffic. Water pipelines should be inside and underground to help prevent freezing in winter.

If made of concrete, the floor of the cowshed should be grooved to allow cows to walk confidently without slipping. The floor should also be durable, easily cleaned, and be impervious to water and urine. The service and cow traffic lanes should allow for easy cleaning with no obstacles or corners that will injure cows.

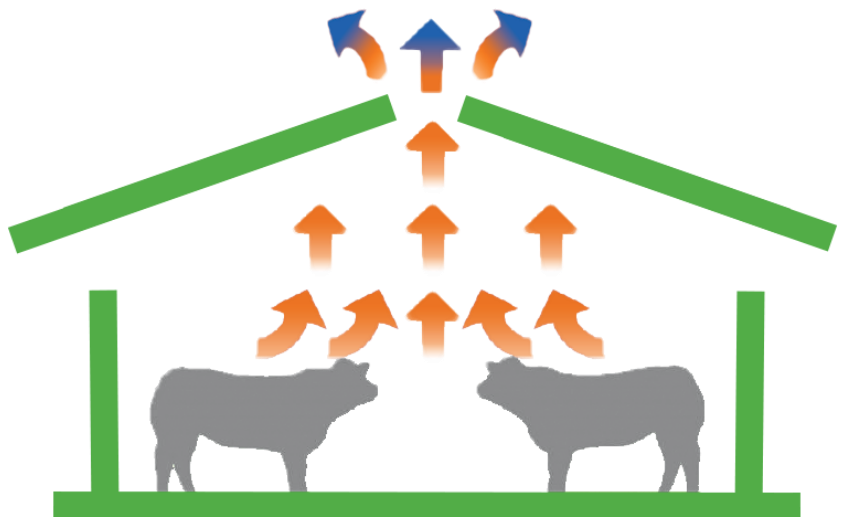
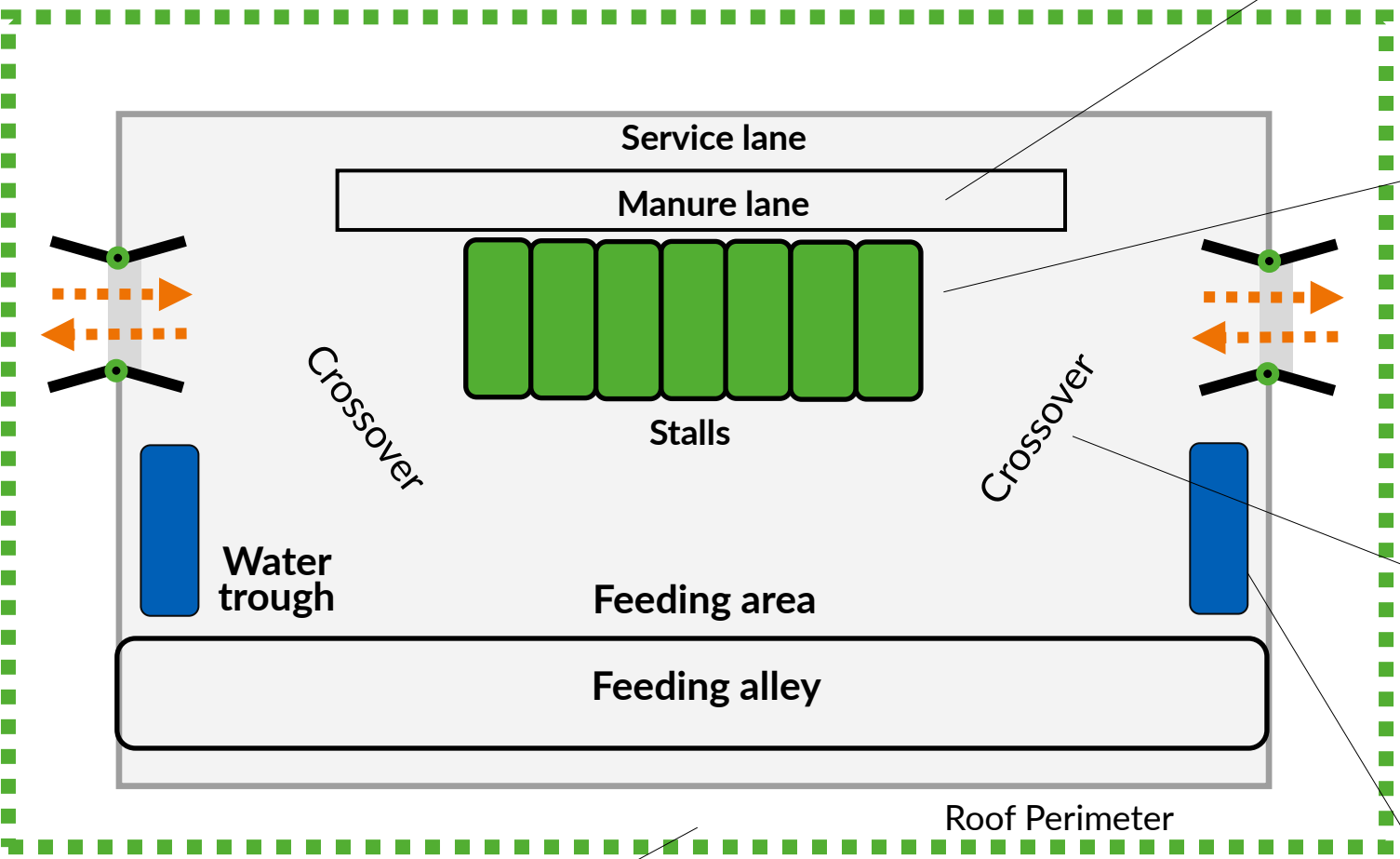


Diagram 2. The roof of the cowshed should be high enough to allow for excellent air movement and air volume inside the building. The sides of the shed should be open to allow for cool air to enter. The top of the barn should be open to allow for hot air and gasses to leave.

Cowshed floors should be grooved so cows are able to walk confidently without risk of slipping. Slippery floors increase cow stress and increase the likelihood of injury. (Image source: Anders Beton)

Good Layout Planning



In a free stall system, manure will collect at the back of the stall. The service lane allows the farmer to easily collect and remove manure.

The stalls are individual places where cows are provided with a reasonably clean and dry bed. The dimensions of the stall must allow the cow to enter and leave stalls easily, to rise up and lie down without injury and to rest comfortably, but not to turn around.

Crossovers allow cows to travel from one are of the shed to another. They should be open and clear so that cows do not get in each others' ways.

The roofed area should be wider than the total floor area of the farm including feeding alley. This will help protect the herd from direct exposure to rain, snow-fall and sunlight.

Cows should be able to access drinking water easily no matter what they are doing. Water troughs should be placed near crossover areas but should not risk creating traffic jams.

1.3 Loose housing cow sheds

In loose housing systems, cows share all spaces and wander freely except during milking and when being treated. This layout option foresees a larger available surface area per cow than stall housing. For loose housing, considerably more straw is needed to provide adequate bedding.

In general, loose housing should:

- Allow free movement of cows
- Provide many places for standing and lying down
- Protect cows from adverse weather conditions
- Provide a dry bedding area
- Enable easy disposal of manure and dirtied bedding

The bedded area should serve as the resting area. Cows prefer to lie down along the peripheral walls of yards, so a rectangular shape with longer peripheral walls is preferable to a square shape.

In a loose free-stall housing system, bedding is spread on top of the floor. Bedding should be at least 10 to 15 cm deep initially. New bedding will then be added as soiled bedding accumulates as an under-layer.

Regular care of the herd should include removal of manure and addition of fresh bedding. The demand for straw will vary depending on the layout, management, climate, and cleanliness of the cows. Fresh straw must be dry, mold-free and should be added regularly to keep surface clean and dry.

The frequency of removal will depend upon factors such as the number of cows, time spent in shed, amount of manure produced, etc. Cleaning out of bedding will likely need to be performed weekly, but there is no universal rule.



In a loose free stall housing layout, cows share bedding areas.
(Image source: Adrian Legge)

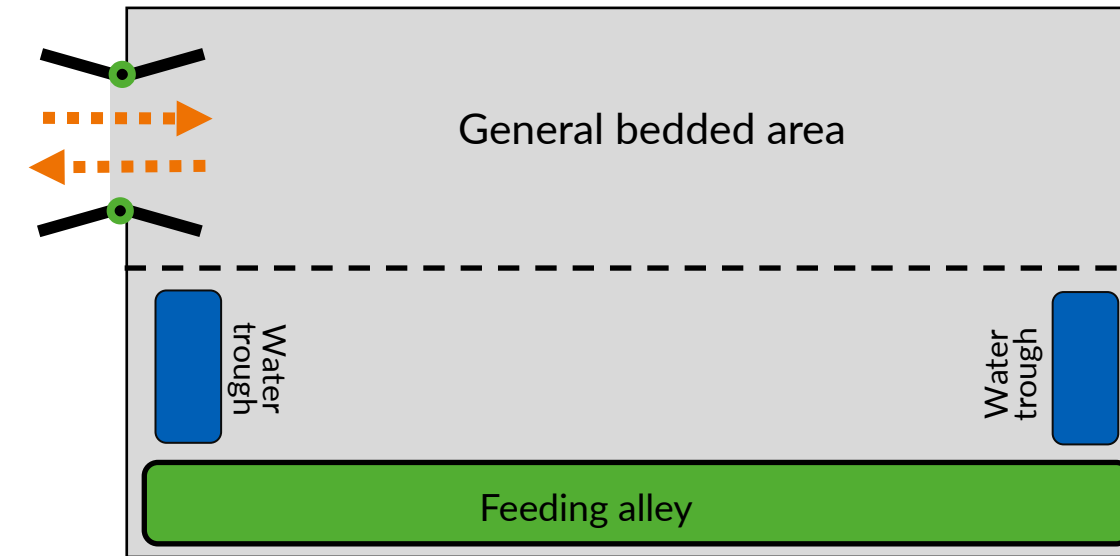


Diagram 3. The minimum space requirement for an individual cow is not only the space needed for resting, but also enough space to allow free access to feeding and drinking areas without risk of injury or aggressive interactions. The distance from the bedded area to the feeding area should be short and direct.

Regular care of the herd should include removal of manure and addition of fresh bedding. The demand for straw will vary depending on the layout, management, climate, and cleanliness of the cows. Fresh straw must be dry and mold-free and should be added regularly to keep surface clean and dry. During dry spells this may be as little as once a week. During wet periods, this may be every day. (Image source: Agriland)

1.4 Free-stall housing

In a free-stall system, bedding is spread only in the stalls and therefore much less straw is needed.

Stalls provide individual spaces where the cows have a reasonably clean and dry bed. The dimensions of the stall must allow the cow to enter and leave the stalls easily, to rise and lie down without injury, and to rest comfortably. They should be wide enough for the cow to lie comfortably but narrow enough to discourage the cow from turning around.

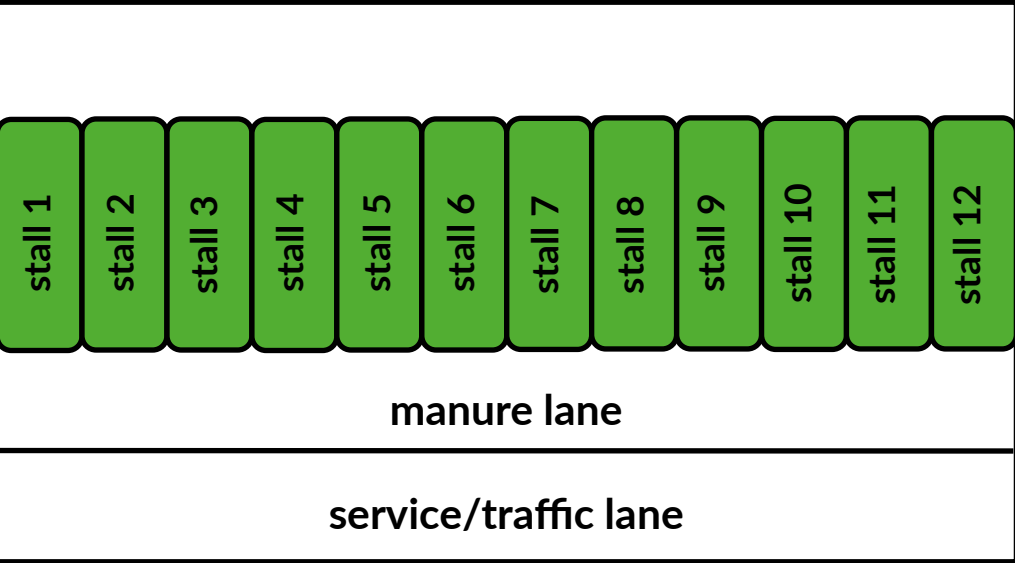


Diagram 4. A simple design will consist of stalls, a feeding lane, manure lane/channel, and service/cow traffic lane.



Cow stalls should be long enough for cows to lay down comfortably but short enough so that waste collects in the manure lane.
(Image source: Anders Beton)

The design and in-farm set-up should ensure that cows excrete feces and urine into the passages and crossovers so that stalls and the bedding will be kept clean. Nevertheless, small quantities of feces will collect on the rear part of the stall and should be cleaned daily.

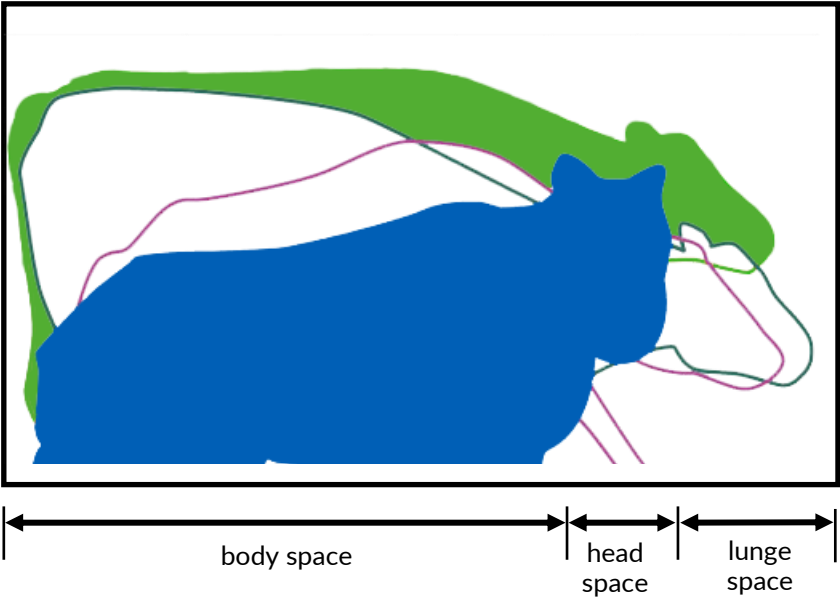
Stalls should not be too big. A shorter stall will prevent soiling of the rear of the stall which is important for good udder health. But too short a length can cause the cows to refuse to use the stalls, to stand only partially in the stalls, or to lie over the curb with the risk of injury and soiling of the udder from manure in the passage.



Stalls can be simple but should be easily accessible for animals and easy to clean for farmers.
(Image source: Anders Beton)

The platform bed should slope slightly downwards (about 3%) towards the curb to ensure good drainage which helps keep the free stall dry and clean.

During the process of standing up, cows heads lunge forward considerably. Too short a stall will not offer enough space for cows to comfortably stand. Cows naturally rise rear-first so as to avoid scraping their udders on the ground. When forced to rise head-first, their udders are at risk of abrasion.



- Body space** – the space from the rear of the cow to the front of her carpal joint
- Head space** – the space in front of the cow occupied by her head while lying
- Lunge space** – the additional space necessary for the thrust of the cow's head as she lunges forward during rising.

2 Feed and Water Management

A farmer may take many steps to increase a herd's well-being, such as through improved housing, sanitation, and breeding practices. However, the first concern should always be adequate feed and water. Unless cattle receive proper nourishment, they will simply remain less healthy and lower producing.

In Abkhazia, cows are fed by grazing most of the year, and in the winter by hay and maize stalks. While these are necessary sources of calories for cows, additional nutrients should be fed if possible. Cows must also drink much water, especially if lactating. Water should be changed regularly and be from a clean source.

Living areas for cows should be designed with access to feed and water in mind. Cows should not have to struggle or compete for access to troughs. Feed and water stations should be strategically placed for easy access but not so that they might block the movement of other cows.

2.1 Watering cows

Cows' water needs will vary by season. Like humans, cows prefer fresh, clean water. Cows will need more water in the summer and will require considerably more water if lactating. Non-lactating cows will drink around 40 to 70 litres a day, while lactating cows can drink up to 120 litres a day. Lactating cows will need to drink 3 litres of water for every 1 litre of milk produced.

Cows need about 5 litres of water for every kilogram of dry food. Water is critical to a cows' proper digestion. One sign that a water supply is inadequate is when animals stop eating. When designing cow living spaces, farmers should pay special attention to the location of the watering troughs and how much space is available for each cow. In general, at least 60 - centimetres of trough space is needed per 10 head of cattle. To keep the water fresh-tasting and pure, troughs should be cleaned periodically, especially when significant slime and algae build-up is observed.

Water troughs should be easily accessible in or near the shed, so cows will drink enough after all day on the pasture. The height of the troughs should be 50-70 centimetres off the ground and allow at least 10 centimetres of space per animal.

Water quality is not only important for cattle health—cows also prefer clean water and will drink less if of low quality.
(Image source: Pixabay)



Water troughs should be strategically placed in the cowshed so as to be easily accessible by cows but not so that cows block each others movements. The height of the troughs should be 50-70 cm off the ground and allow at least 10 cm of space per animal.
(Image source: Stockmanship)



2.2 Feeding cows

Grazing cows receive most of their nutritional requirements from grasses in pastures. In foraging-based dairy production, almost all nutrients are obtained throughout the day via grazing. Cows which are fed only through foraging will also greatly benefit from small amounts of concentrated feed to make up the remainder of the nutrients they need.

During winter cows must be fed from feed stores such as bales of hay and silage. The quality of stored feed naturally decreases over time, yet the spoilage rate will be much higher if poorly stored. Areas of storage must be dry and well-ventilated. Any hay contaminated by mold should be thrown out.

Silage is nutritious feed for cattle made from leftover crops, crop residues, and grasses. In Abkhazia, it can be made on small farms from plants and crops such as maize, wheat, clover, oats, alfalfa, and timothy grasses. When making silage, ingredients are combined in a closed space such as a sack, a barrel or even a ditch in the ground and is then pressed and covered. The silage is preserved by natural fermentation that takes place in anaerobic (oxygen-free) conditions for up to 3 weeks.

Good quality silage can last up to two years and is best if it has a slightly earthy or vinegary smell. It should be dry and greenish brown. Depending on the ingredients and conditions, silage can have very different odors. Spoiled silage becomes black and moldy and will begin to have a strong smell.



Quality silage should be dry and brown to greenish-brown.
(Image source: Hoard's Dairyman)



3. MILKING HYGIENE

Hygienic milking practices are critical to keeping milk safe to drink and for lowering spoilage risks. Milk will spoil eventually once exposed to air, yet these spoilage rates will be much slower if the proper procedures are followed. Milk becomes quickly contaminated once exposed to air. When the teat is infected, fresh milk may already be contaminated. The most common dairy cattle health problem is known as mastitis. This condition occurs when udder tissue becomes infected.

The following chapter will discuss the most important hygienic principles of milking, how sick cows should be managed, and basic milk handling guidelines.



Cleaning of cow udders with paper helps prevent infection and spread of bacteria during milking (Photo: Anthea Ktching)

3.1 Milking Hygiene

Hygienic milking practices serve to protect both the milk and the cow. For healthy cows, milk secreted from the teat will have low levels of bacteria. Therefore, the best way to avoid milk contamination is to keep everything that comes near milk as clean as possible. Not only should hands be thoroughly washed, but the cow's udders should be cleaned as should the milking area and any equipment used.

All care should be taken to reduce the number of contact surfaces for the fresh milk. For example, dipping one's hands, or anything else, into the milk should absolutely be avoided, as should transferring milk among numerous containers. As much as is possible, milk should also be protected from flies.

Teats should be clean and dry before being milked. If a teat is dirty, it should be washed with clean water, then dried with clean towel. Paper towels are preferable to cloth, as paper will be discarded between milking cows while reused cloths can spread bacteria. Fingernails are a common place for bacteria to hide and travel among cows. Farmers should take care to keep fingernails short and clean before milking. Following milking, the milking spaces should be rinsed with clean water. Milk spaces should be equipped with a water source and be easy to clean.

While milk contamination is an inevitable part of dairy farming, the rates of contamination can be greatly reduced by following the above precautions.



3.2 Mastitis: A Common Infection

The most common kind of cow infection is called mastitis. Mastitis occurs when cow udders become infected by bacteria. In herds without an effective mastitis treatment plan, rates of mastitis can be as high as half of all dairy cows. When a cow is suffering from a mastitis infection, both quality and total yield of milk will be reduced.

While mastitis presents as swollen and red udders, initial signs of infections are often difficult to detect. Sometimes mastitis occurs within the teat with no clear visible signs, and is detectable only through close inspection of the foremilk, as described in the next section.

Farmers should be aware of the signs of infection. At each milking, farmers should check the udder and teats for any abnormalities.

Signs of mastitis include:

- ✔ Teats that appear enlarged, feel hard, or are tighter than usual
- ✔ Teats that are sensitive so that the cow becomes upset while being milked
- ✔ Teats that feel hot to the touch, indicating fever
- ✔ Milk that is thicker than usual, so that it is slow to go through a strainer
- ✔ Milk that does not readily separate into cream
- ✔ Milk that sours within a day or two, rather than staying sweet for a week
- ✔ Milk that tastes unusual, for example salty, cheesy, or “like a barn”



Teats may become red and sore during a mild case of mastitis, however signs may be difficult to detect and in some cases will not be visible at all. (Image source: Irina Pommer)



Milk from infected udders may be watery, smelly, discolored or chunky.



Traffic areas should be free of obstacles which may damage udders and lead to infections. (Image source: Lindsay France)



Udders infected with mastitis may swell and become hard. (Image source: Pixabay)



Mastitis often begins with an abrasion or cut to a teat. (Image source: Mundo Agro)



Infected udders will often redden in later stages of mastitis. Farmers should be aware of the early signs of mastitis and isolate infected animals. (Image source: Omiconeline)

3.3 Reducing Rates of Mastitis

The most effective way to reduce risk of infections to udders is dipping or spraying teats with disinfectant immediately after milking. Washing udders with disinfectant will help prevent colonization by bacteria and also improve the process of healing of teat sores and lesions.

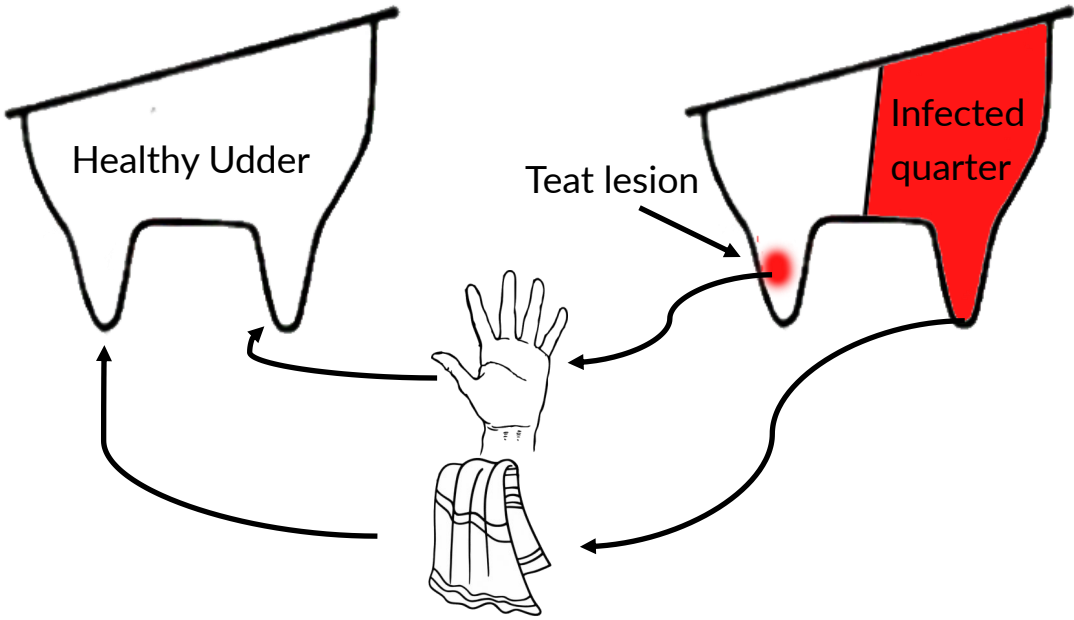
A simple disinfectant solution can be prepared with one litre of water to 1 oz. of bleach. It is important that not more bleach is used as concentrated bleach can dry out teats. While cleaning teats with disinfectant is not common in Abkhazia, farmers should strongly consider adopting this practice, especially if their herd is suffering from higher rates of mastitis.



A teat dip is a common method for keeping udders clean and infection free. (Image source: Belagrogen)

Mastitis will often result in low quality milk that should be thrown out so as not to spoil other milk. Yet not all cases of mastitis will present visibly on the udder as is the case with cases of subclinical mastitis.

Subclinical mastitis must be detected by close examination of milk. Contaminated milk will often be visibly different, such as clotted, watery, or with flakes. If abnormal milk is suspected, a farmer should splash some of the milk on a dark surface to examine it more



Cloths and hands will spread infection from infected teats to healthy udders.

closely. Foremilk may be extracted and checked before milking.

To reduce risks of infection, cows should not lay down directly after milking as the teat canals will not have had time to close and will be vulnerable to the introduction of bacteria. To encourage cows to remain standing, farmers can provide fresh feed after milking.

Mastitis often begins with a trauma to the teat itself, such as being scratched or bruised. Farmers should keep an eye out for potential obstacles and areas that present a physical risk to cows.

Infected cows will spread their harmful bacteria to other cows. To reduce the risk of spreading infections, farmers should milk any cow with signs of infection after all others. If the teat is cleaned before being milked, the risk of cow-to-cow transfer of pathogens that cause mastitis or milk contamination will be greatly reduced.

3.4 Post-milking practices and storage

When poured into one container, bad milk from one cow will spoil all milk. It will be impossible to tell which cow's milk was bad. As it is impractical to keep milk from each cow in separate containers, farmers should pay close attention to their cows and identify which cows may be

suffering from an infection. Potentially contaminated milk should be kept separate and monitored. This way, a farmer can avoid ruining entire batches of milk and better identify infections.

Microbial activity increases in warmer temperatures. Once milk has been collected, the container should be covered as quickly as possible and kept in a cool area. In Abkhazia, milk is usually processed quickly into dairy products, thereby reducing spoilage rates. However, if intended for transportation without processing, the milk should be boiled and stored carefully.



Unprocessed milk should be stored in closed containers in a cool, dry place.

4 Fertility Management

Good fertility management is one of the most effective means of improving the efficiency and profitability of dairy farms. Good fertility management means cows should calve at the right time of year, be observed when in heat (oestrus), and be serviced efficiently by a stud and impregnated as quickly as possible.

4.1 Best Management Practices

The following are the key activates and best practices for improving herd replacement and productivity:

- Identify objective of breeding regime based on cost effective and efficient breeding options
- Identify which cows are in heat
- Supply adequate nutrition to facilitate reproduction
- Keep accurate records on the reproductive status of each cow
- Milking cows must be well fed in order to rebreed. Cows that are too thin or too fat will have lower fertility
- Evaluate the status of the herd periodically

Image source: Zimunda



Herd fertility should not be left up to nature. Farmers should know when a cow is in heat, when it will be serviced, how many times it is serviced per conception, which bull is servicing which cow, the number of calvings per herd, the performance history of the bull, etc. A cow in heat requires special treatment. They should not be let out to pasture but should stay on the farm and be serviced by the bull or artificially inseminated.

Furthermore, only bulls with high quality reproduction characteristics should be allowed to service cows. It is therefore important that farmers remember which calves were sired by which bull so that bulls that produce the best calves can be given special breeding access. Other factors to consider when choosing a sire are low rates of sickness and strong physical characteristics. For these purposes, farm books should be kept.

Artificial insemination is also an excellent practice to manage fertility, but is infrequently practiced in Abkhazia due in part to political constraints that present challenges to the sale and purchase of semen. When practiced, programmes of artificial insemination are often ineffective and unstructured. In the future, the Abkhazian veterinary service has the potential to play a key role in organizing and encouraging best practices for artificial insemination, including facilitating and tracking the import of semen, record keeping and extension, and the issuing of relevant legal documents.

4.2 Understanding the oestrus cycle

To ensure a herd's reproductive performance, a farmer needs to be able to identify the heat cycles of cows and heifers. Trying to breed cows that are not in heat leads to low fertility and economic loss. The best time for insemination is oestrus or standing heat.

During oestrus, the cow experiences increased levels of oestrogen and will display signs of being in heat. Within the first 24 hours of oestrus, an egg is released and ovulation begins. The average heat duration is between 15 and 18 hours but may vary from 8 to 30 hours. If the egg is not fertilised, it is discharged and the process begins again in approximately 21 days.

If the cow is seen in heat in the morning then it is advisable to service/inseminate the cow in the evening of the same day. If the cow is seen in heat in the evening, it is advisable to service/inseminate the cow in the morning of the next day.



When in full heat, cows will often mount or jump on other cows.

A cow in heat will exhibit several signs. During calving season, a farmer should look for these signs and plan accordingly. These signs will present differently and with varying levels of intensity. In general, signs of heat include:

- Allowing mounting behaviour: when not in heat, cows will resist being mounted by other cows. During heat, cows will often stand still to allow for mounting.
- Swelling, red vulva: A cow in heat will usually have a noticeably swelled and reddened vulva and discharge mucous.
- Restlessness: when in heat, a cow is restless and will stand while other cows are laying down. They may bellow and move out of line. They will likely eat less during this period.
- Increased friendliness: Cows in heat behave differently socially. They will often lick and sniff other cow's genitals and mount them.



When a cow is beginning to come in heat, they will become restless, bother other cows, and often sniff and lick other cow's genitals

This booklet is intended as a short, introductory guide to cattle management in Abkhazia. We encourage farmers wishing to build or refurbish their farm to consult the experts trained under the Action Against Hunger project and to visit our demonstration farms.

February 2020