Agricultural Innovation Program (AIP) for Pakistan

AIP-Livestock Fact Sheet no: 11

DAIRY EXTENSION MATERIAL

CLEAN MILK PRODUCTION

Introduction

Buyer and consumer of raw milk expect to receive a product which is **fresh** and with the **natural composition**, all stakeholders involved in milk production, collection and marketing must try their utmost best to achieve these goals.

If the consumers do not get high quality fresh milk produced in Pakistan they will **switch to buying imported milk**, and the dairy farming community might lose part of this most important business. Future exports of milk and milk products will also be affected.

This training and reference manual is intended to be used by livestock extension staff to train and advice dairy farmers on how to improve the cleanness and hygiene of fresh milk to please customers and by this to achieve sustainability in milk production.

The Composition of Milk

The main components of milk are water, milk sugar, also called lactose, fat, protein, and minerals. Since milk is a natural product and not industrially manufactured its composition varies and is never 100%

The average composition of cow milk:

Water	87%
Fat	4%
Protein	3%
Milk sugar	5%
Minerals	1%

What may influence the composition of milk?

- **Breed and individuality of cows**

Both milk yield and composition vary considerably among breeds of dairy cattle. Milk from **Jersey has about 5%** fat while **Friesians contain 3-4%** of fat. **Zebu cows** can give milk of up to 7% fat. Fat content in crossbreds milk falls in-between local and exotic. **Buffalo milk** contains around **8% fat**. Milk of individual cows within a breed varies over a wide range both in yield and contents of the various constituents.

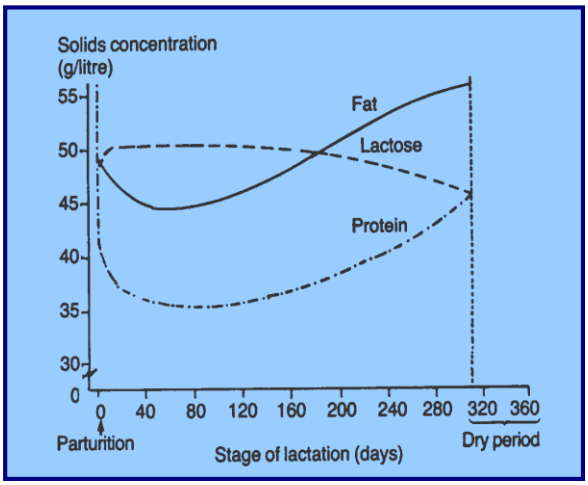
- **Interval between milking**

The **fat content** varies considerably between the morning and evening milking because there is usually a much shorter interval between morning-evening milking than between evening-morning milking.

If cows were milked at **12-hours intervals** the variation in fat content between milking **would be negligible**, but this is not practicable on most farms. Normally, the solid-non-fat (SNF) content does not vary with the length of time between the milking.

- **Completeness of milking**

The first milk drawn from the udder contains about 1-1.5% of fat while the last milk contains 5-8% fat. Thus, it is essential to milk the cow completely and thoroughly mix all the milk before you taking a sample for testing. The fat left in the udder at the end of milking is usually picked up during subsequent milking, so there is no net loss of fat.



Fat content is high immediately after calving but soon begins to fall, and continues to do so for 10-12 weeks, after which it tends to rise again until the end of the lactation period. The high protein content of early lactation milk is due to high globulin content found in colostrum (globulins are proteins that protects the new born calf from infection transmitted by the mother).

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- **Stage of lactation**

The fat, lactose and protein contents of milk vary according to stage of lactation. SNF contents are usually highest during the first 2-3 weeks, after which it deceases slightly.

The Quality of Milk

Milk from the udder of a healthy cow contains **very few bacteria**. Poor hygiene introduces additional bacteria that cause the milk to get spoilt very quickly. To ensure that raw milk remains fresh for a longer time, you need to practise good hygiene during milking and when handling the milk afterwards.

Important factors that influence milk quality:

- **Feeding**

Do not feed the cow with silage during milking or shortly before milking, as this will give rise to off-flavours in the milk.

It is recommended that silage feed to be provided two hours before milking!!

Certain feeds/feed ingredients could contain above safe levels of **aflatoxin**, which will invariably end up in the **milk**, and cause **harmful effects to humans**. Both farmers and consumers need to be made aware of this problem.

- **Health of the cow**

An **unhealthy cow** will feed less and produce less milk of poor quality. Cows should always be kept healthy and clean because **sick animals can transmit diseases like tuberculosis and brucellosis to milk consumers**. If you suspect your cow is sick, contact a qualified veterinary practitioner immediately. When the cow is being treated with antibiotics, you must not sell or consume its milk until the withdrawal period is over. **Both fat and SNF contents can also decrease because of diseases, particularly mastitis**.

Animal and udder health

- **Zoonosis**

Zoonotic diseases like **tuberculosis** and **brucellosis** can be spread to humans through milk. Cows suffering from such diseases should be referred to a qualified veterinary practitioner who will decide on the fate of the animal. Farmers are encouraged to vaccinate their animals against brucellosis. **Animals should** also be **checked periodically** for all types of contagious diseases and treated promptly in case of infections.

- **Mastitis**

Mastitis is an inflammation of the mammary glands in the udder caused by infection with disease-causing bacteria. These bacteria can also end up in the milk and result in illness if the milk is consumed. **For this reason, milk from cows suffering from mastitis should not be sold or drunk**. You can control mastitis by observing general hygiene and proper milking procedures. Hair at the udder should be kept short by trimming. Cows suffering from mastitis should be treated by a qualified veterinary practitioner. **Milk from animals that are undergoing antibiotic treatment should not be consumed or sold** until the withdrawal period has elapsed because antibiotic residues may cause allergies and drug resistance in consumers.

Farmer/milk collector has a great responsibility of producing and keeping milk clean and safe. In order **to produce clean milk of good quality** the following should be observed:

- **Cows:** This is the most important component of clean milk production. The animal should be clean (free from dust and dirt) and healthy (disease free: TB, brucellosis and mastitis).
- **Clean milking equipment:** Milking equipment should be kept clean and free from bacteria. Clean milking and storage environment
- **Milk handling:** All personnel involved in milk handling must be disease free and clean. Milker should be clean and wear clean clothes.
- **Storage and cooling of milk:** Proper facilities are required for storage, cooling and handling the milk until it is collected. Storage temperatures should about 40 C.
- **Feeding routines:** Some feeds flavours taste defects in milk. Such feeds should be fed to animals after milking and it is important to bring animals from grazing 1 hour prior to milking time.
- **Flies:** Large fly numbers irritates the cows. A proper eradication program should be adopted for flies can contribute greatly to bacteria count in milk.
- **Water:** A farm should have adequate water supply. Clean water supply contributes greatly to clean milk production.
- **Good milking:** This involves milking at regular intervals, and fast.
- **Knowledge:** Both farmers and consumers should be made aware of the importance of clean and safe milk.

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