

FAO ANIMAL PRODUCTION AND HEALTH



guidelines

GUIDE TO GOOD DAIRY FARMING PRACTICE



Cover photographs:

Left and center: ©IDF

Right: ©FAO/Alberto Conti

GUIDE TO GOOD
DAIRY FARMING PRACTICE

The first edition of this guide was originally published by the Food and Agriculture Organization of the United Nations and the International Dairy Federation (IDF) in English as *Guide to Good Dairy Farming Practices*, 2004. It is available at www.fao.org/DOCREP/006/Y5224E/Y5224E00.htm and <ftp://ftp.fao.org/docrep/fao/006/y5224e/y5224e00.pdf>

Recommended citation

FAO and IDF. 2011. *Guide to good dairy farming practice*. Animal Production and Health Guidelines. No. 8. Rome.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations, or of the International Dairy Federation (IDF) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO or the IDF in preference to others of a similar nature that are not mentioned. The views expressed in this information product are those of the author(s) and do not necessarily reflect the views of FAO or the IDF.

ISBN 978-92-5-106957-8

All rights reserved. FAO and or IDF encourage reproduction and dissemination of material in this information product. Non-commercial uses will be authorized free of charge, upon request. Reproduction for resale or other commercial purposes, including educational purposes, may incur fees. Applications for permission to reproduce or disseminate FAO copyright materials, and all queries concerning rights and licences, should be addressed by e-mail to copyright@fao.org or to the Chief, Publishing Policy and Support Branch, Office of Knowledge Exchange, Research and Extension, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.

© FAO and IDF, 2011 (this revised edition)

© FAO and IDF, 2004 (original edition)

Contents

Foreword	v
Acknowledgements	vi
Introduction	1
A basis in Good Agricultural Practice (GAP)	1
About this guide	1
Objective and scope	2
Other references of relevance	2
How the guidelines are presented	3
Good dairy farming practices	5
1. Animal health	5
2. Milking hygiene	6
3. Nutrition (feed and water)	7
4. Animal welfare	8
5. Environment	9
6. Socio-economic management	10
Fact sheets	11
1. Animal health	11
2. Milking hygiene	17
3. Nutrition (feed and water)	21
4. Animal welfare	25
5. Environment	30
6. Socio-economic management	34

Foreword

Dairy farmers' production systems worldwide need to be able to combine profitability with the responsibility of protecting human health, animal health, animal welfare and the environment. Dairy farmers, as the primary producers in the supply chain, should also be given the opportunity to add value to their product by adopting methods of production that satisfy the demands of processors and customers.

This Guide gives individual dairy farmers proactive guidance on how these objectives can be achieved on their farm.

The *Guide to good dairy farming practice* has been written in a practical format for dairy farmers engaged in the production of milk from any dairy species. When adopted, it will support the production and marketing of safe, quality-assured milk and dairy products. The Guide focuses on the relationship between consumer safety and economic, social and environmental management at the farm level.

The Guide contains many individual practices that contribute to good dairy farming practice, covering the key aspects of animal health, milk hygiene, nutrition, welfare, the environment and socio-economic management.

These practices have been drawn from best practice guidelines and existing assurance schemes around the world, and so individual practices will vary in their applicability to various dairying regions. They are not intended to be legally binding and readers are encouraged to select and implement those guidelines that are of relevance to their situation.

As such, this Guide aims to provide a genuine framework for dairy farm assurance schemes to be developed globally, giving individual countries and dairy farmers the opportunity to develop schemes that are specific to their needs.

MISSION STATEMENT

To elaborate a practical, farm orientated, globally achievable *Guide to good dairy farming practices for dairy farmers*, covering key aspects of dairy farm management including: animal health, milk hygiene, animal nutrition, animal welfare, the environment and socio-economic management.

Helen Dornom

Chair

*IDF/FAO Project Group of the
IDF Standing Committee on
Farm Management*

Berhe G. Tekola

Director

*Animal Production and Health Division
Food and Agriculture Organization of
the United Nations*

Acknowledgements

This new Guide updates the first edition produced by the IDF/FAO Task Force on Good Dairy Farming Practices in 2004.

The IDF/FAO Project Group of the IDF Standing Committee on Farm Management included the following experts: Helen Dornom (AU) - Chair, Réjean Bouchard (CA), Jude Capper (US), J Eric Hillerton (NZ), David Homer (GB), Eirini Fragkiadaki (GR), Jamie Jonker (US), Cheryl McCrindle (ZA), Marie Natacha (FR), Marcin Preidl (DE), M U Siddiqui (IN), Olaf Thieme (FAO) and Yong-Suk Son (KR). The group was supported by other IDF experts who made an active contribution to the work: Elizabeth Berry (GB), Olivier Cerf (FR), Robin Condron (AU), Elisabeth Erlacher-Vindel (OIE), Ham Junsang (KR), Mohan Namjoshi (IN), Daniel Scholl (CA), Joerg Seifert (IDF), Rafal Artur Stachura (PL) and Vincent Turner (ZA).

Special thanks must be given to Helen Dornom (AU) assisted by Robert Greenall (AU) for compiling the information into a coherent document. Thanks also go to Pierre Doyle of FIL-IDF Canada and Thierry Geslain of FIL-IDF France for ensuring the translation of the document from English to French and to Pedro Valentin-Gamazo of IDF Spain for taking charge of the translation into Spanish. The FAO Animal Production and Health Division (AGA) arranged translation into other official working languages of FAO and the publication of the Guide.

Introduction

A BASIS IN GOOD AGRICULTURAL PRACTICE (GAP)

Good Agricultural Practice for dairy farmers is about implementing sound practices on dairy farms – collectively called *Good Dairy Farming Practice*.

These practices must ensure that the milk and milk products produced are safe and suitable for their intended use, and also that the dairy farm enterprise is viable into the future, from the economic, social and environmental perspectives.

Most importantly, dairy farmers are in the business of producing food for human consumption so they must be confident in the safety and quality of the milk they produce. Good dairy farming practice underpins the production of milk that satisfies the highest expectations of the food industry and consumers.

The international framework to ensure the safety and suitability of milk and milk products is contained in the Codex Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1- 1969, Rev. 4, 2003)¹ together with the Codex Code of Hygienic Practice for Milk and Milk Products (CAC/RCP 57-2004)². This Guide picks up the principles within these documents that relate to the production of milk on farms. It recognises that dairy farmers are an integral part of a larger dairy food production and processing chain and that all participants in the chain - dairy farmers, suppliers to dairy farmers, milk carriers and haulers, dairy product and food manufacturers, distributors, retailers and consumers - should be part of an integrated food safety and quality assurance management system. Dairy farmers can play their part by ensuring that good dairy farming practices are implemented at the farm level.

Good dairy farming practice also ensures that the milk is produced by healthy animals in a manner that is sustainable and responsible from the animal welfare, social, economic and environmental perspectives. So implementing good dairy farming practice is good risk management for the short and long term future of the dairy farming enterprise. This Guide encourages dairy farmers to adopt 'proactive' preventative practices rather than waiting for problems to occur.

In summary, this Guide details Good Agricultural Practice (GAP) for dairy farmers, underpinning the production of safe, quality-assured dairy products in a sustainable manner that underpins the future of dairy farming on a local, national and international scale.

¹ Recommended International Code of Practice – General Principles of Food Hygiene, CAC/RCP 1 – 1969. Available at www.codexalimentarius.net

² Code of Hygienic Practice for Milk and Milk Products, CAC/RCP 57 - 2004. Available at www.codexalimentarius.net

ABOUT THIS GUIDE

Many dairy companies/cooperatives and countries have introduced on-farm safety and quality assurance programmes aimed at assuring the safety and quality of their dairy products.

The objective of this document is to provide a farmer-orientated guide to practices that are achievable in the diverse range of dairy farming systems used around the world. The approach taken in this guide is to:

- highlight relevant aspects that need to be proactively managed on dairy farms;
- identify the desired outcomes in dealing with each of these areas;
- specify good practice that addresses the critical hazards; and
- provide examples of control measures that should be implemented to achieve the objectives.

This Guide is intended as a resource for dairy farmers, to be used or implemented in a way that is relevant to their particular farming system. The focus is on the desired outcomes, rather than on specific, prescriptive actions/processes. The guide does not have any legal status and does not supersede national or international requirements.

OBJECTIVE AND SCOPE

The guiding objective for good dairy farming practice is that safe, quality milk should be produced from healthy animals using management practices that are sustainable from an animal welfare, social, economic and environmental perspective.

To achieve this objective, dairy farmers should apply good practice in the following areas:

- animal health;
- milking hygiene;
- nutrition (feed and water);
- animal welfare;
- environment; and
- socio-economic management.

For each of these categories this Guide lists good dairy farming practices, and suggests measures that can be implemented to achieve the desired outcome.

OTHER REFERENCES OF RELEVANCE

In developing this Guide, reference was made to a number of sources; including international publications from Codex Alimentarius (CODEX), Food and Agriculture Organisation of the United Nations (FAO), International Dairy Federation (IDF), World Organisation for Animal Health (OIE), Sustainable Agriculture Initiative (SAI) as well as a number of on-farm assurance programmes from various countries.

In particular, when developing individual, company or country-specific guidelines for good dairy farming practices (or on-farm quality assurance programmes), reference should be made to the following documents:

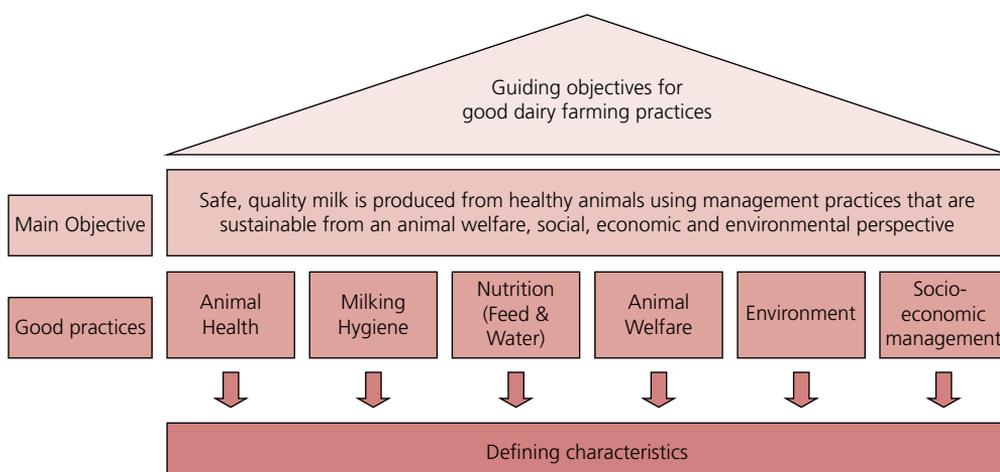
- Codex Alimentarius: Food Hygiene - The Basic Texts (4th ed)³.
- Codex Alimentarius: Recommended International Code of Practice – General Principles of Food Hygiene CAC/RCP 1 – 1969³.

- Codex Alimentarius: Code of Hygienic Practice for Milk and Milk Products CAC/RCP 57 - 2004³.
- Codex Alimentarius: Code of Practice on Good Animal Feeding CAC/RCP 54-2004³.
- FAO: Food Quality and Safety Systems – A training manual on food hygiene and the Hazard Analysis and Critical Control Point (HACCP) system (1998)⁴.
- OIE: Terrestrial Animal Health Code⁵.
- SAI Platform: Principles and Practices for Sustainable Dairy farming (2009)⁶.

HOW THE GUIDELINES ARE PRESENTED

The Guidelines are presented in two forms:

1. Good dairy farming practices and suggested measures are set out in tabular form for each key area: animal health, milking hygiene, animal nutrition, animal welfare, environment and socio-economic management.
2. Individual Fact Sheets are provided for each area giving further details on how to implement the good dairy farming practices.



³ Available at www.codexalimentarius.net

⁴ Available from www.fao.org

⁵ Available from www.oie.int

⁶ Available from www.saiplatform.org

Good dairy farming practices

1. ANIMAL HEALTH

Animals that produce milk need to be healthy and an effective health care programme should be in place.

Good dairy farming practice	Examples of suggested measures to achieve good dairy farming practice	Objectives of these measures
1.1 Establish the herd with resistance to disease	1.1.1 Choose breeds and animals well suited to the local environment and farming system 1.1.2 Determine herd size and stocking rate based on management skills, local conditions and the availability of land, infrastructure, feed, and other inputs 1.1.3 Vaccinate all animals as recommended or required by local animal health authorities	Enhance herd disease resistance / reduce stress
1.2 Prevent entry of disease onto the farm	1.2.1 Only buy animals of known health status (both herd and individual animals) and control their introduction to the farm using quarantine if indicated 1.2.2 Ensure animal transport on and off the farm does not introduce disease 1.2.3 Monitor risks from adjoining land and neighbours and have secure boundaries 1.2.4 Where possible, limit access of people and wildlife to the farm 1.2.5 Have a vermin control programme in place 1.2.6 Only use clean equipment from a known source	Maintain farm biosecurity Keep animals healthy Comply with international/national/regional animal movement and disease controls
1.3 Have an effective herd health management programme in place	1.3.1 Use an identification system that allows all animals to be identified individually from birth to death 1.3.2 Develop an effective herd health management programme focused on prevention that meets farm needs as well as regional and national requirements 1.3.3 Regularly check animals for signs of disease 1.3.4 Sick animals should be attended to quickly and in an appropriate way 1.3.5 Keep sick animals isolated 1.3.6 Separate milk from sick animals and animals under treatment 1.3.7 Keep written records of all treatments and identify treated animals appropriately 1.3.8 Manage animal diseases that can affect public health (zoonoses)	Detect animal diseases early Prevent spread of disease among animals Ensure food safety Ensure traceability
1.4 Use all chemicals and veterinary medicines as directed	1.4.1 Only use chemicals approved for supply and use under relevant legislation 1.4.2 Use chemicals according to directions, calculate dosages carefully and observe appropriate withholding periods 1.4.3 Only use veterinary medicines as prescribed by veterinarians 1.4.4 Store chemicals and veterinary medicines securely and dispose of them responsibly	Prevent occurrence of chemical residues in milk

2. MILKING HYGIENE

Milk should be harvested and stored under hygienic conditions. Equipment used to harvest and store milk should be suitable and well maintained.

Good dairy farming practice	Examples of suggested measures to achieve good dairy farming practice	Objectives of these measures
2.1 Ensure milking routines do not injure the animals or introduce contaminants* into milk	2.1.1 Identify individual animals that require special milking management	Prepare animals for hygienic milking
	2.1.2 Ensure appropriate udder preparation for milking	Use suitable, well maintained and clean equipment for milking and milk storage
	2.1.3 Milk animals regularly using consistent milking techniques	Avoid contaminants in milk
	2.1.4 Segregate milk harvested from sick or treated animals for appropriate disposal	
	2.1.5 Ensure milking equipment is correctly installed and maintained	
	2.1.6 Ensure a sufficient supply of clean water	
2.2 Ensure milking is carried out under hygienic conditions	2.2.1 Ensure housing environment is clean at all times	Harvest milk under hygienic conditions
	2.2.2 Ensure milking area is kept clean	
	2.2.3 Ensure the milkers follow basic hygiene rules	
	2.2.4 Ensure milking equipment is cleaned and, when necessary, disinfected after each milking	
2.3 Ensure milk is handled properly after milking	2.3.1 Ensure milk is cooled or delivered for processing within the specified time	Minimise spoilage of milk after harvesting
	2.3.2 Ensure milk storage area is clean and tidy	Refrigerate and store milk under hygienic conditions
	2.3.3 Ensure milk storage equipment is adequate to hold milk at the specified temperature	
	2.3.4 Ensure milk storage equipment is cleaned and when necessary, sanitised after each milk collection	
	2.3.5 Ensure unobstructed access for bulk milk collection	

*A contaminant is defined as any biological or chemical agent, foreign matter, or other substance, not intentionally added to food, that may compromise food safety or suitability.

3. NUTRITION (FEED AND WATER)

Animals need to be fed and watered with products of suitable quality and safety.

Good dairy farming practice	Examples of suggested measures to achieve good dairy farming practice	Objectives of these measures
3.1 Secure feed and water supplies from sustainable sources	3.1.1 Plan ahead to ensure that the herd's feed and water requirements are met 3.1.2 Implement sustainable nutrient, irrigation and pest management practices when growing feed 3.1.3 Source farm inputs from suppliers implementing sustainable systems	Provide the herd with adequate feed and water Limit the potential impact of dairy feed production on the environment
3.2. Ensure animal feed and water are of suitable quantity and quality	3.2.1 Ensure the nutritional needs of animals are met 3.2.2 Ensure the feed fed to dairy animals is fit for purpose and will not negatively impact the quality or safety of their milk or meat 3.2.3 Ensure suitable quality water is provided and the supply is regularly checked and maintained 3.2.4 Use different equipment for handling chemicals and feed stuffs 3.2.5 Ensure chemicals are used appropriately on pastures and forage crops and observe withholding periods 3.2.6 Only use approved chemicals for treatment of animal feeds or components of animal feeds and observe withholding periods	Keeping animals healthy with good quality feed Preserve water supplies and animal feed materials from chemical contamination Avoid chemical contamination due to farming practices
3.3. Control storage conditions of feed	3.3.1 Separate feeds intended for different species 3.3.2 Ensure appropriate storage conditions to avoid feed spoilage or contamination 3.3.3 Reject mouldy or sub-standard feed	Prevent microbiological or toxin contamination or unintended use of prohibited feed ingredients or feeds contaminated with chemical preparations Keeping animals healthy with good quality feed
3.4. Ensure the traceability of feedstuffs brought on to the farm	3.4.1 Where possible, source animal feed from suppliers having an approved quality assurance programme in place 3.4.2 Keep records of all feed or feed ingredients received on the farm	Quality of the feeds fed to dairy animals is assured by the supplier or farmer Prevent the use of feeds that are unsuitable for dairy animals

4. ANIMAL WELFARE⁷

Animals should be kept according to the following 'five freedoms'⁸:

- Freedom from thirst, hunger and malnutrition
- Freedom from discomfort
- Freedom from pain, injury and disease
- Freedom from fear
- Freedom to engage in relatively normal patterns of animal behaviour

Good dairy farming practice	Examples of suggested measures to achieve good dairy farming practice	Objectives of these measures
4.1 Ensure animals are free from thirst, hunger and malnutrition	4.1.1 Provide sufficient feed and water for all animals every day 4.1.2 Adjust stocking rates and/or supplementary feeding to ensure adequate water, feed and fodder supply 4.1.3 Protect animals from toxic plants and other harmful substances 4.1.4 Provide water supplies of good quality that are regularly checked and maintained	Healthy, productive animals
4.2 Ensure animals are free from discomfort	4.2.1 Design and construct buildings and handling facilities to be free of obstructions and hazards 4.2.2 Provide adequate space allowances and clean bedding 4.2.3 Protect animals from adverse weather conditions and the consequences thereof 4.2.4 Provide housed animals with adequate ventilation 4.2.5 Provide suitable flooring and footing in housing and animal traffic areas 4.2.6 Protect animals from injury and distress during loading and unloading and provide appropriate conditions for transport	Protection of animals against extreme climate conditions Provide a safe environment
4.3 Ensure animals are free from pain, injury and disease	4.3.1 Have an effective herd health management programme in place and inspect animals regularly 4.3.2 Do not use procedures and practices that cause unnecessary pain 4.3.3 Follow appropriate birthing and weaning practices 4.3.4 Have appropriate procedures for marketing young dairy animals 4.3.5 Protect against lameness 4.3.6 Milk lactating animals regularly 4.3.7 Avoid poor milking practices as they may injure dairy animals 4.3.8 When animals have to be euthanized on-farm, avoid unnecessary stress or pain	Justified and humane actions Good sanitary conditions Prevention of pain, injury and disease Prompt treatment of pain, injury and disease Humane destruction of badly injured or incurably diseased animals
4.4 Ensure animals are free from fear	4.4.1 Consider animal behaviour when developing farm infrastructure and herd management routines 4.4.2 Provide competent stock handling and husbandry skills and appropriate training 4.4.3 Use facilities and equipment that are suitable for stock handling	Animals are less fearful of people, their handling facilities and their environment. Safety of animals and people
4.5 Ensure animals can engage in relatively normal patterns of animal behaviour	4.5.1 Have herd management and husbandry procedures that do not unnecessarily compromise the animals' resting and social behaviours	Freedom of movement Preserve gregarious behaviour and other behaviours, such as preferred sleeping position

⁷ For more details on Animal Welfare, please refer to the IDF Guide to Good Welfare in Dairy Production 2008 www.fil-idf.org

⁸ Adapted from the 'Five Freedoms', Farm Animal Welfare Council, U.K. www.fawc.org.uk

5. ENVIRONMENT

Milk production should be managed in balance with the local environment surrounding the farm.

Good dairy farming practice	Examples of suggested measures to achieve good dairy farming practice	Objectives of these measures
5.1 Implement an environmentally sustainable farming system	5.1.1 Use farm inputs such as water and nutrients efficiently and sustainably 5.1.2 Minimise the production of environmental pollutants from dairy farming 5.1.3 Manage livestock to minimise adverse environmental impacts 5.1.4 Select and use energy resources appropriately 5.1.5 Maintain and/or encourage biodiversity* on the farm	Dairy farming practices meet statutory and community expectations
5.2 Have an appropriate waste management system.	5.2.1 Implement practices to reduce, reuse or recycle farm waste as appropriate 5.2.2 Manage the storage and disposal of wastes to minimize environmental impacts	Limit the potential impact of dairy farming practices on the environment Dairy farming practices comply with relevant regulations
5.3 Ensure dairy farming practices do not have an adverse impact on the local environment	5.3.1 Contain dairy runoff on-farm 5.3.2 Use agricultural and veterinary chemicals and fertilisers appropriately to avoid contamination of the local environment 5.3.3 Ensure the overall appearance of the dairying operation is appropriate for a facility in which high quality food is harvested	Minimise the impact of milk production on the local environment Present a positive image of dairy farming

*Biodiversity or 'biological diversity' relates to the number of different life forms in an ecosystem. In the farm context it relates to the variation in life (animal, plant and other life forms) inhabiting the farm.

6. SOCIO-ECONOMIC MANAGEMENT

Dairy farming provides economic and social benefits to farmers and their wider communities. Good dairy farming practice can also help to manage the social and economic risks to the enterprise.

Good dairy farming practice	Examples of suggested measures to achieve good dairy farming practice	Objectives of these measures
6.1 Implement effective and responsible management of human resources	6.1.1 Implement sustainable work practices	Ensure personal workloads are sustainable
	6.1.2 Employ staff based on national laws and practice	Improve labour productivity
	6.1.3 Manage human resources effectively, ensuring that their working conditions comply with applicable laws and international conventions	Protect dairy staff from exploitation
	6.1.4 Ensure the farm working environment complies with relevant occupational health and safety requirements	Limit risks to staff, livestock and infrastructure Ensure farming enterprise is socially responsible
6.2 Ensure farm tasks are carried out safely and competently	6.2.1 Have appropriate procedures and equipment in place for undertaking dairy farming tasks	Limit risks to staff, livestock and infrastructure
	6.2.2 Induct and train/educate staff appropriately for their work	
	6.2.3 Ensure staff carry out their tasks competently	
	6.2.4 Choose competent people for training, advice and interventions	
6.3 Manage the enterprise to ensure its financial viability	6.3.1 Implement financial management systems	Improve profitability
	6.3.2 Adopt agricultural practices that contribute to the productivity and/or profitability goals of the enterprise	Limit risks to financial viability of enterprise
	6.3.3 Plan ahead to manage financial risks	

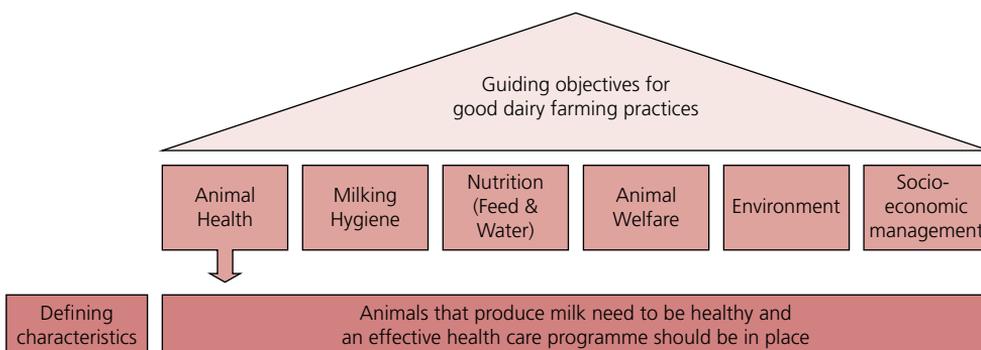
Fact sheets

1. ANIMAL HEALTH

This Fact Sheet describes good dairy farming practice to ensure animals that produce milk are healthy and there is an effective health care programme in place. However, not all of the practices are applicable in all circumstances and may be superseded by national, international or market demands.

The suggested good dairy farming practices for animal health are set out under the following headings:

- Establish the herd with resistance to disease.
- Prevent entry of disease onto the farm.
- Have an effective herd health management programme in place.
- Use all chemicals and veterinary medicines as directed.



1.1 Establish the herd with resistance to disease

1.1.1 Choose breeds and animals well suited to the local environment and farming system

Different dairy species and breeds have different requirements. Selecting dairy animals that are suited to the local environment will greatly reduce the risks to productivity posed by animal health and welfare problems. Of particular relevance is the animals' ability to adapt to climatic extremes, feed quality, local parasites (especially ticks) and their acquired resistance to endemic disease.

The demands on the animals also vary with the farming system. Housed animals may have a higher exposure to communicable diseases, whilst extensively maintained animals are more prone to parasitic infections. Animals introduced from different locations may be vulnerable to endemic diseases in the new location due to lack of previous exposure and the development of immunity.

1.1.2 Determine herd size and stocking rate based on management skills, local conditions and the availability of land, infrastructure, feed, and other inputs

Larger herds and higher stocking rates generally require a higher level of organisation, infrastructure and skill to manage. The risks are magnified in these specialised dairy farming systems. Disease burdens can be higher and individual animals requiring intervention can be more difficult to identify and treat. Good planning and management skills are required to manage risks that have serious consequences.

In developing countries overstocking, droughts and fires should be taken into account when determining stocking rates. Drastic seasonal changes (eg Monsoons, deep snow, subzero temperatures, high humidity or heat) may require different farming systems (eg housed or pastures) depending on the time of year. Fodder supplies must be carefully planned for all contingencies as dairy animals require a constant source of good quality feed and water at all times.

1.1.3 Vaccinate all animals as recommended or required by local animal health authorities

Vaccination is a useful tool to limit the impact of disease by increasing the immunity of the animal population to specific pathogens. Animal health authorities can provide dairy farmers with information about the specific vaccines which are recommended for their area. In some dairying regions, dairy farmers are required by law to vaccinate their stock against serious contagious diseases.

1.2 Prevent entry of disease onto the farm

1.2.1 Only buy animals of known health status (both herd and individual animals) and control their introduction to the farm using quarantine if indicated

The most effective way to prevent the spread of infectious diseases is to keep a closed herd. This means no new animals enter the herd and previously resident animals do not re-enter after they have left the herd. This is difficult to achieve in practice, so strict control of any animal introductions is essential. Increased risk of disease may also occur when animals share grazing or other facilities.

Prior to being introduced to the farm, all dairy herds and animals should be screened for diseases that are significant to their area of origin and new location. All animals should have:

- an identification system to enable trace back to their source (a birth to death identification system); and
- some form of Vendor Declaration or certification that details the health/disease status of animals and any appropriate tests, treatments, vaccinations or other procedures that have been or are being carried out. Potential sellers of dairy livestock must keep appropriate permanent animal health records for their animals. The health status of the vendor herd should also be certified. This is particularly important for diseases with long incubation periods like paratuberculosis etc.

Where the animals' health status is unknown, they should be kept under quarantine or separate to the existing animals for an appropriate length of time.

Introduced animals should be inspected on arrival and should be free of external parasites such as ticks. Sick animals should be rejected. It is good practice to consider treating all introduced animals for internal parasites on arrival.

Keep records of all animal movements to and from the farm.

1.2.2 Ensure animal transport on and off the farm does not introduce disease

Potential buyers of live animals should always ask and be told if the animals are sick or diseased. Preferably, no sick or infirm animals should be transported alive. A suitably trained operative or a veterinarian should carry out any euthanizing required on-farm.

The disposal of diseased and dead animals should be done in a way that minimizes the risk of disease spread and in line with the guidelines in the OIE Terrestrial Animal Code and/or local regulations. For example, transport vehicles should not move dead or diseased animals from one farm to another farm, without taking appropriate actions to minimize the risk of spreading disease.

1.2.3 Monitor risks from adjoining land and neighbours and have secure boundaries

Be aware of local (endemic) diseases and/or exotic diseases which have the potential to affect the health of the herd or flock, especially from neighbouring farms. Contain animals appropriately to ensure there is no risk of disease spread between farms and within farms.

1.2.4 Where possible, limit access of people and wildlife to the farm

People (and vehicles) visiting a number of farms may spread disease between the farms. Keep tanker/milk pick up access and public tracks clear of faecal contamination. Restrict access to an 'as needs' basis and put in place appropriate processes to minimize disease spread. Visitors to the farm should wear clean protective clothing and clean, disinfected footwear if entering areas that pose a high risk of transferring disease onto or from the farm. Records of all visitors should be kept as appropriate. Disease can be spread both from and to humans and wildlife. Avoid visitor contact with animals unless necessary.

1.2.5 Have a vermin control programme in place

Ensure that appropriate vermin controls are in place in all areas where vermin could breed, introduce disease and/or affect milk safety and quality. Vermin breeding sites should be eliminated, especially if those sites also harbour disease pathogens, such as manure heaps, livestock disposal sites etc. Vermin control measures may also be required in the milking shed, feed and water storages and animal housing areas. Vermin species vary geographically but can include indigenous animals, rodents, birds and insects.

1.2.6 Only use clean equipment from a known source

Ensure all agricultural and veterinary equipment introduced on to the farm is clean and steps have been taken to prevent the introduction of disease. This may include asking questions about the history of where the equipment comes from and how it has been used. Take extra care with shared or borrowed equipment.

1.3 Have an effective herd health management programme in place

1.3.1 Use an identification system that allows all animals to be identified individually from birth to death

All dairy animals should be easily identifiable by all people who come in contact with them. The systems used should be permanent, allowing individual animals to be uniquely identified from birth to death. Examples of identification systems include ear tagging, tattooing, freeze branding and radio frequency identification (RFID) measures such as microchips.

1.3.2 Develop an effective farm herd health management programme focused on prevention that meets farm needs as well as regional and national requirements

Herd health programmes aim to keep all livestock healthy and productive. They should include the farm's practices for the diagnosis, treatment, prevention and control of relevant animal diseases, including internal and external parasites. It is important to ensure a consistent approach to herd health, so all staff should be aware of and understand the farm's herd health programme.

The programme should cover all aspects of animal husbandry and handling, milk harvesting as well as other dairy farm management practices relevant to animal health. This may include disease screening, vaccination and/or control measures being required by animal health authorities or supply contracts.

Where effective vaccines are available, they may be used to increase resistance to disease. Prophylactic treatments may be required as protective measures when no viable alternative strategy exists.

Effective herd health programmes should be developed in consultation with appropriately skilled people such as veterinarians.

1.3.3 Regularly check animals for signs of disease

Observe all animals regularly and use proven methods to aid in detection and accurate diagnosis of infectious disease. Some useful tools may include rectal thermometers, observations of animal behaviour and body condition, and examination of foremilk. Laboratory or other tests may be necessary to screen animals for disease. Herd and/or animal-level disease testing may also be available through statutory disease control programmes or communal milk collection/herd improvement centres.

Detailed breeding and reproductive records should be kept and animals observed at appropriate stages as many diseases are associated with reproduction.

Clinical diseases should be investigated to determine the underlying cause(s) so that animals can be treated and further cases prevented. Regular management practices such as hoof care programmes can reduce the incidence of lameness.

1.3.4 Sick animals should be attended to quickly and in an appropriate way

Treat all disease, injury and poor health by proven methods after accurate diagnosis. Treat diseased animals appropriately to minimize the prevalence of infection and the source of pathogens.

1.3.5 Keep sick animals isolated

Where possible and if indicated, keep sick animals isolated on the farm to minimize the spread of contagious disease. Provide separate facilities and/or milk sick animals last. Prompt treatment can limit the spread of infectious agents. Clean and disinfect equipment after it has been in contact with sick animals and ensure people coming into contact with these animals take precautions to avoid infections.

1.3.6 Separate milk from sick animals and animals under treatment

Follow appropriate procedures to separate milk from sick animals and animals under treatment. This milk is not suitable for human consumption and if stored on farm should be clearly labelled as such. Clean milking equipment and utensils thoroughly to avoid cross contamination.

1.3.7 Keep written records of all treatments and identify treated animals appropriately

It is important that staff, veterinarians and others involved with handling dairy animals on the farm know what treatments have been given to which animals. Put in place an appropriate system to readily identify treated animals, and record appropriate details in accordance with local regulations and to manage withholding periods for milk and meat.

1.3.8 Manage animal diseases that can affect public health (zoonoses)

Follow local regulations and OIE recommendations to control zoonoses. Aim to keep diseases of public health significance at a level in animal populations that is not hazardous to people. Avoid direct transmission to people through appropriate animal management and hygienic practices. Ensure the safe disposal of animal waste and carcasses. Prevent the contamination of milk with faeces and urine or other animal wastes. Do not use milk from sick animals for human consumption. Manage the risks posed by drinking raw milk from farms.

1.4 Use all chemicals and veterinary medicines as directed

1.4.1 Only use chemicals approved for supply and use under relevant legislation

Only use chemicals that have been assessed and registered for use in dairy production by the relevant authority.

1.4.2 Use chemicals according to directions, calculate dosages carefully and observe the appropriate withholding period¹⁰

Using agricultural and veterinary chemicals for the purpose of which they were approved, and in accordance with label directions, gives a predictable outcome whilst managing the potential risks. Dairy farmers should manage the use of all chemicals to prevent the chemicals adversely affecting animal health and productivity, the health and safety of the user, the environment or the safety and quality of milk and meat products.

¹⁰ The withholding period (or withdrawal period) is the minimum period which must elapse between last administration or application of a chemical product and the first grazing, slaughter for meat and/or harvesting of milk for human consumption

Be aware of chemicals that can leave residues in milk. These may include detergents, teat disinfectants, dairy sanitisers, anti-parasitics, antibiotics, herbicides, pesticides and fungicides.

Dairy farmers should:

- use chemicals only for the purpose for which they are approved. For example lactating animals should never be treated with veterinary products that are not recommended for treatment of animals producing milk supplied for processing or otherwise used for human consumption;
- read the label as it will contain all the information about the legal and safe use of the chemical;
- follow the advice given on the label and any chemical data sheet or risk assessment; and
- observe the specified withholding periods.

1.4.3 Only use veterinary medicines¹¹ as prescribed by veterinarians

Veterinary medicines pose risks to humans, animals and food safety and are subject to special controls on their supply and use.

Use only approved veterinary medicines, at the recommended dose according to the label directions, or as prescribed or advised by a veterinarian. Relevant withholding periods must be observed.

All veterinary medicines and chemicals intended for treatment of food-producing animals should have a withholding period stated on the label. If label directions are not strictly followed, the stated withholding period will not be valid. If no withholding time is stated or no labelling instructions exist, the product should not be used.

The use of veterinary medicines contrary to the label recommendations is termed 'off-label use' and poses additional risks. Off-label use of veterinary medicines must only occur under strict veterinary supervision and in compliance with national/regional regulations.

1.4.4 Store chemicals and veterinary medicines securely and dispose of them responsibly

Store chemicals and veterinary medicines securely to ensure they are not used inappropriately or do not unintentionally contaminate milk and feed. Check and observe product expiry dates. Chemicals and their containers should also be disposed of in a way that will not cause contamination to animals or the farm environment.

¹¹ Veterinary medicines are chemical and biological products sold for the treatment of animals where evidence of proven efficacy and safety have been examined by independent review bodies to ensure that the products are suitable for their purpose. These medicines may require a prescription from a veterinarian to allow purchase and to confirm that their use is appropriate.

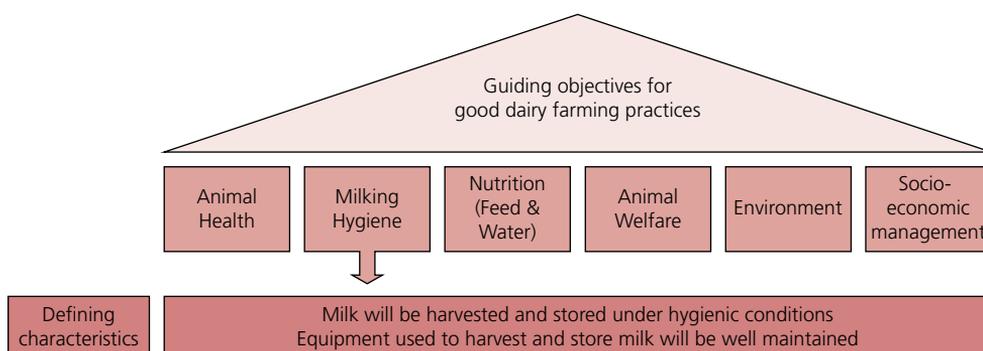
2. MILKING HYGIENE

Milking is the defining activity of dairy farming. Consumers demand high standards of milk quality, so milking management aims to minimize microbial, chemical and physical contamination. Milking management covers all aspects of the process of obtaining milk from animals quickly and effectively, while assuring the health of the animals and the quality of the milk.

Consistency in the day-to-day implementation of milking procedures is an important part of good dairy farming practice for milking.

This Fact Sheet describes practices that ensure milk is harvested and stored under hygienic conditions, and that the equipment used to harvest and store milk is well maintained. The suggested good dairy farming practices for milking hygiene are set out under the following headings:

- Ensure milking routines do not injure the animals or introduce contaminants¹² into milk.
- Ensure milking is carried out under hygienic conditions.
- Ensure milk is handled properly after milking.



2.1 Ensure milking routines do not injure the animals or introduce contaminants into milk

2.1.1 Identify individual animals that require special milking management

Individual animals should be easily identifiable by all people who come in contact with them. The system used should be permanent, allowing individual animals to be identified from birth to death. Additional temporary identification systems should be in place on farms to manage animals that require special handling at milking, such as treated or diseased animals, or animals producing milk that is not suitable for human consumption.

2.1.2 Ensure appropriate udder preparation for milking

Wash and dry dirty teats before milking. Only milk animals with clean, dry teats.

Check the udder and teats for any abnormalities which may indicate clinical mastitis.

The foremilk may be extracted and checked for abnormalities before each animal is

¹² A contaminant is defined as any biological or chemical agent, foreign matter, or other substance, not intentionally added to food, that may compromise food safety or suitability.

milked. This may be a regulatory or contractual requirement for dairy animals in some countries.

2.1.3 Milk animals regularly using consistent milking techniques

Institute regular milking times and routines. Ensure good milking technique is consistently applied. Incorrect or variable milking techniques can result in a higher mastitis risk and injury to the animal.

The correct technique for machine milking is to:

- prepare animals properly before milking;
- attach the cups to clean, dry teats;
- avoid unnecessary air ingress at cup attachment;
- avoid overmilking;
- remove cups gently; and
- when necessary, apply teat disinfectant to each teat after milking according to national recommendations and regulations.

The correct technique for hand-milking is to:

- restrain the animal to be milked using a method that does not cause pain or injury;
- ensure the milker's hands are clean and dry;
- prepare the teats for milking, ensuring they are clean and dry;
- only use appropriate teat lubricants according to national recommendations and regulations;
- handle the teats gently, ideally using the 'fist-grip' method, avoiding any discomfort, pain or injury to the animal;
- use buckets that are non-corrosive, easy to clean and disinfect, and do not taint the milk;
- avoid contaminating the collected milk with foreign material such as dust, dirt, soil, urine, manure (faeces) and protect it from flies; and
- when necessary, apply teat disinfectant to each teat after milking according to national recommendations and regulations.

2.1.4 Segregate milk harvested from sick or treated animals for appropriate disposal

Animals whose milk is unfit for human consumption should be milked last or with a separate bucket or system. Store or discard abnormal milk in a manner appropriate to the risk posed to people, animals and the environment.

2.1.5 Ensure milking equipment is correctly installed and maintained

Manufacturers' and local, regional or national recommendations should be followed for construction, installation, performance and maintenance of the equipment used for milking. Inspect and replace perishable components if evidence of wear is found. Materials used for milking equipment that come into contact with milk and with cleaning and disinfecting fluids should be made from adequately resistant materials and should not impart a taint to milk.

Follow the manufacturers' instructions when using cleaning and disinfecting agents on milking equipment, including any requirements to rinse following application. Only use

cleaning and disinfecting agents approved for use by the relevant authority. These chemicals should be used in a way that ensures they do not have an adverse effect on the milk or milking equipment. Store all chemicals, other than those in routine use, in a lockable area away from the milk storage area.

2.1.6 Ensure a sufficient supply of clean water

A sufficient supply of clean water should be available for milking operations, for cleaning the equipment that comes into contact with milk and for cleaning the milking area.

The quality of the water should be suitable for its intended use. Standards regarding the quality of water used in milk production are mandated in many countries, including the use of potable water in cleaning surfaces that come into contact with milk.

2.2 Ensure milking is carried out under hygienic conditions

2.2.1 Ensure housing environment is clean at all times

A high standard of cleanliness should be maintained at all times in housing areas to decrease soiling of the udder and so protect udder health. The housing area should:

- be designed to provide good drainage and ventilation and to avoid animal injury;
- be of suitable size and designed to cater for the size of the animal and the herd; and
- have adequate loose bedding which is maintained in a hygienic condition.

All stalls and beds should be kept clean and dry (eg by replacing the bedding frequently). Regularly clean or scrape passageways to remove manure.

2.2.2 Ensure milking area is kept clean

The milking area should be designed to allow it to be kept clean and tidy. It should:

- be easy to clean;
- have a clean water supply;
- have waste handling facilities; and
- have sufficient temperature regulation, ventilation and light.

Construct holding yards to enable a high standard of cleanliness to be maintained.

2.2.3 Ensure the milkers follow basic hygiene rules

The milker should:

- wear suitable and clean working clothes;
- keep hands and arms clean especially when milking;
- cover cuts or wounds; and
- not have any infectious disease transmissible via milk.

2.2.4 Ensure milking equipment is cleaned and when necessary, disinfected after each milking

Establish a routine to ensure milking equipment is clean before each use. If mobile milking equipment is used, this may mean cleaning between each use.

Use chemicals approved for the cleaning and/or disinfecting of milking equipment. Use water of suitable quality heated to the required temperature. Milk contact surfaces should be disinfected as required and in accordance with national recommendations and regulations.

2.3 Ensure milk is handled properly after milking

2.3.1 Ensure milk is cooled or delivered for processing within the specified time

Cool milk as soon as possible after milking to the required storage temperature and within the specified time. Cooling times and storage temperatures should conform to limits set by the relevant authority.

Limits on the time taken between milking and delivery to the milk collection centre may exist in developing countries where the cooling or processing of milk is undertaken off the farm.

2.3.2 Ensure milk storage area is clean and tidy

Milk should be stored away from the milking area. The milk storage area should:

- be clean and clear of accumulated rubbish, any products or chemical substances not in constant use and any feedstuffs;
- have hand washing and drying facilities; and
- be easy to clean and have pest control practices in place.

2.3.3 Ensure milk storage equipment is adequate to hold milk at the specified temperature

The storage equipment should be capable of holding milk at the required temperature until collection, and be constructed of materials that do not taint the milk.

Bulk tanks should be built to recognized standards and milk refrigeration systems should have a regular maintenance and service programme to prevent breakdowns. The bulk tank should be equipped with a thermometer to check the temperature of the milk and appropriate records kept of storage temperatures. Ensure that all of the equipment is working properly.

2.3.4 Ensure milk storage equipment is cleaned and when necessary, sanitised after each milk collection

To ensure milk storage equipment is clean before use, clean and, when necessary, sanitise it after each milk collection. Milk contact surfaces should be sanitised as required in accordance with national recommendations and regulations.

2.3.5 Ensure unobstructed access for bulk milk collection

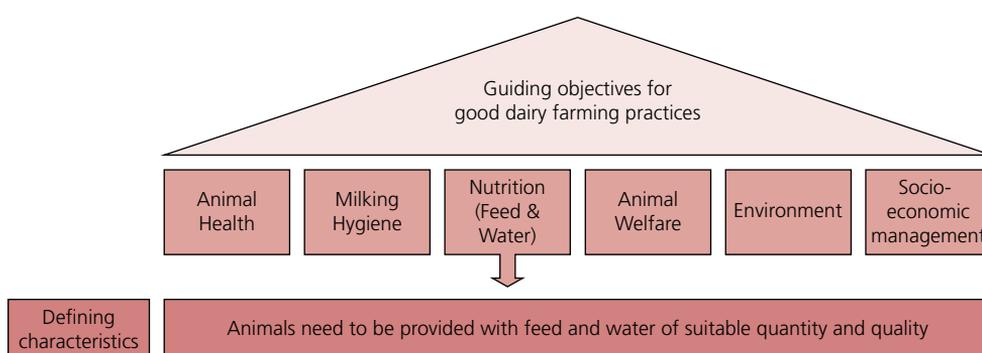
Provide unobstructed access to the milk storage area to enable the safe collection of milk. Access to the milk collection areas should be free of animal pathways, mud and other potential contaminants.

3. NUTRITION (FEED AND WATER)

The quantity and quality of the feed and water provided largely determines the dairy animal's health and productivity, and the quality and safety of its milk.

This Fact Sheet describes good dairy farming practice for managing animal nutrition, both feeding and watering. The suggested practices are set out under the following headings:

- Secure feed and water supplies from sustainable sources.
- Ensure animal feed and water are of suitable quantity and quality.
- Control storage conditions of feed.
- Ensure the traceability of feedstuffs brought on to the farm.



3.1 Secure feed and water supplies from sustainable sources

3.1.1 Plan ahead to ensure that the herd's feed and water requirements are met

Budgeting the herd's feed and water requirements in advance reduces risk and may help the dairy farmer identify less expensive sources of feed. Planning feed and water requirements ahead can enhance the sustainability of the farm enterprise.

Utilise appropriate feeding and watering methods and infrastructure to ensure all livestock have adequate access.

3.1.2 Implement sustainable nutrient, irrigation and pest management practices when growing feed

Many farming systems rely on home grown feed for their livestock. Implementing good dairy farming practice includes managing the flow of nutrients on the farm, including the appropriate use of effluent and fertilisers for growing feed. Finite resources such as water for irrigation must also be managed sustainably. Implementing integrated pest management strategies can reduce chemical use.

3.1.3 Source farm inputs from suppliers implementing sustainable systems

Where possible, dairy farmers should consider sourcing farm inputs such as feed, water, fertiliser and energy from suppliers adopting sustainable practices, and so reduce the environmental impact of their own enterprise.

3.2 Ensure animal feed and water are of suitable quantity and quality

3.2.1 Ensure the nutritional needs of animals are met

Dairy animals should be provided with sufficient feed and water daily, according to their physiological needs. The quality and quantity of the feed, including appropriate fibre, should reflect the animal's age, body weight, stage of lactation, production level, growth, pregnancy, activity and climate.

Sufficient space and time needs to be given for each animal to get access to feed and water. Good feeding management will reduce competitive pressure and diminish aggressive behaviours between individual animals.

3.2.2 Ensure the feed fed to dairy animals is fit for purpose and will not negatively impact the quality or safety of their milk or meat

Dairy farmers should ensure that the feed fed to dairy livestock does not contain chemical residues, toxins or other contaminants that pose a risk to animal health or the safety or quality of milk or meat derived from these animals. This can be achieved by carefully following the label directions of agricultural chemicals used on pastures and crops being grown for stock feed on the farm. Assurance about previous chemical treatments and the feed's suitability as a stock feed should be sought from off-farm suppliers.

Fence off or restrict access to areas where contaminated feed or toxic plants may be consumed by dairy animals. Inspect feed for signs of contamination or spoilage prior to feeding.

3.2.3 Ensure suitable quality water is provided and the supply is regularly checked and maintained

Fence stock water supplies to protect them from unintentional contamination. Water supplies should be of suitable quality and free of excrement.

Many contaminants can enter water supplies and threaten the health or safety of people, livestock and the milking equipment rinsed with the contaminated water. The most common contaminants include pathogenic microorganisms and their toxins, as well as toxic chemicals such as pesticides, petroleum, solvents and nitrates.

Contact the relevant authorities and have the water tested if there are any concerns about the suitability of the water for animals to drink.

3.2.4 Use different equipment for handling chemicals and feed stuffs

Never mix agricultural chemicals and/or veterinary chemicals in equipment or facilities used to handle feed or water for dairy livestock. Residues can remain on equipment or cross-contamination can occur via spills, air dispersal, back-siphoning effects etc.

3.2.5 Ensure chemicals are used appropriately on pastures and forage crops and observe withholding periods

Maintain stringent paddock records of all chemical applications to crops and pastures, and ensure grazing withholding periods are closely observed. Always follow the label for application rates and withholding times before allowing animals access to a treated field for grazing or forage harvesting. Always follow regulated processes for spray technologies.

Check pasture for signs of pesticide drift. Look for signs of herbicide damage on forage plants. If signs are present, investigate further before allowing animals to graze.

Be aware of the potential for spray drift when applying agricultural chemicals to pastures and crops. Take adequate precautions when allowing stock to drink the water after spray applications.

Find out about the past and present use of chemicals on your farm and neighbouring properties as spray drift may be a potential source of residues. When buying fodder or land, always obtain information on the paddock's previous history of agricultural chemical use and/or conduct a soil or plant test if residues are suspected.

3.2.6 Only use approved chemicals for treatment of animal feeds or components of animal feeds and observe withholding periods

Only chemicals approved for use in dairy operations should be used.

Chemicals should be managed in a manner that avoids their accidental introduction into the feed and water and, as a result, into milk.

Use chemicals in accordance with manufacturers' recommendations. Check labels of all chemicals that are to be used around, on or in feeds or pastures for compatibility with food-producing animals, withholding requirements for milk, and proper application rates and concentration of products.

Withholding periods may also apply to pastures, forage crops and stored grains if they have been treated with an agricultural chemical. Different withholding periods may apply if the crop is also intended for human consumption.

3.3 Control storage conditions of feed

3.3.1 Separate feeds intended for different species

National regulations must be observed such that no prohibited animal material is included in dairy feed rations.

3.3.2 Ensure appropriate storage conditions to avoid feed spoilage or contamination

Ensure animals are not able to come into contact with contaminants in areas where these products are stored and mixed. These areas should be well ventilated as toxic fumes may be given off.

Ensure that feed is protected from contaminants. Store and handle pesticides, treated seeds, medicated feed and fertilizers properly. Store herbicides separately from other agricultural chemicals, fertilizers and seeds. Provide an appropriate vermin control programme for stored feed.

Hay and dry feeds should be protected from a moist environment. Silage and other fermented crops should be kept under sealed conditions.

3.3.3 Reject mouldy or sub-standard feed

Avoid feeding any mouldy feed to dairy animals. A wide range of feeds can contain poisonous fungal toxins that can be transferred to milk, particularly if they have not been stored correctly. Monitor feed for other gross contaminants such as plant or animal matter, metal, plastics, string and other undesirable items.

3.4 Ensure the traceability of feedstuffs brought on to the farm

3.4.1 Where possible, source animal feed from suppliers having an approved quality assurance programme in place

If you buy in feed, ensure the feed supplier has an assurance programme in place, can monitor appropriate residues and diseases and can trace the ingredients used back to their source. Ask for a relevant vendor declaration.

3.4.2 Keep records of all feed or feed ingredients received on the farm

Have an appropriate system in place to record and trace all feed or feed ingredients received onto the farm. Request a vendor declaration and/or a written consignment note with each feed delivery. Make sure you can identify and trace all treatments applied to feeds on-farm (including crop and grain treatments).

4. ANIMAL WELFARE¹³

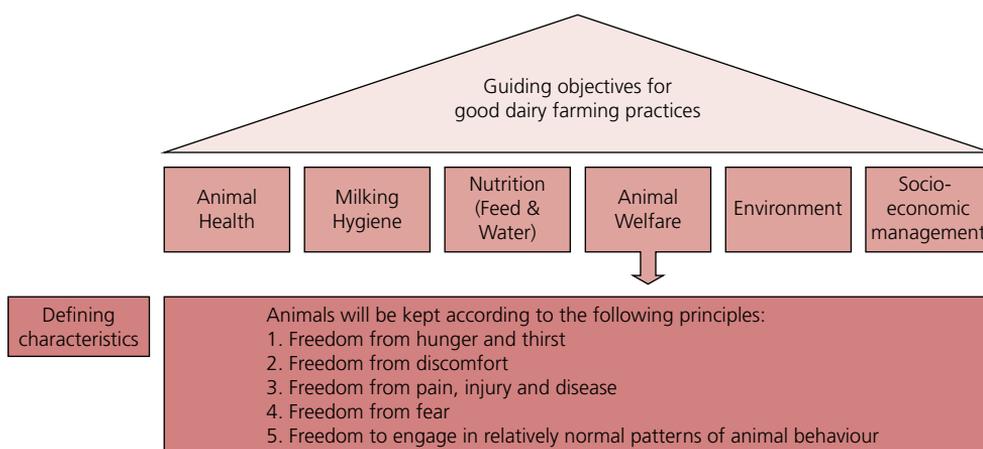
In essence, animal welfare is the application of sensible and sensitive animal husbandry practices to the livestock on the farm. Animal welfare is primarily concerned with the well-being of the animal.

In general, consumers perceive high animal welfare standards as an indicator that food is safe, healthy and of high quality. Animal welfare standards have been incorporated into most on-farm food quality and food safety schemes.

Many animal welfare codes list 'five freedoms'¹⁴ that should underpin best farm practice in relation to animal welfare. These five freedoms provide a comprehensive overall concept of animal welfare.

This Fact Sheet describes good dairy farming practices for animal welfare. They are set out to reflect the five freedoms:

- Ensure animals are free from thirst, hunger and malnutrition.
- Ensure animals are free from discomfort.
- Ensure animals are free from pain, injury and disease.
- Ensure animals are free from fear.
- Ensure animals can engage in relatively normal patterns of animal behaviour.



4.1. Ensure animals are free from thirst, hunger and malnutrition

4.1.1 Provide sufficient feed and water for all animals every day

Dairy livestock should be given sufficient feed, based on their physiological needs. Their requirements will vary according to their age, body weight, stage of lactation, production level, growth, pregnancy, activity and environment. Provide enough space around feeding and watering points to reduce bullying and ensure all livestock have sufficient access.

¹³ For more details on Animal Welfare, please refer to the IDF Guide to Good Welfare in Dairy Production 2008 www.fil-idf.org.

¹⁴ Adapted from the 'Five Freedoms', Farm Animal Welfare Council, U.K. www.fawc.org.uk

The quality (palatability and nutrient content) of the feed also needs to be considered, based on the animal's dietary requirements. Dietary supplements need to be considered if the ration is unable to meet the animal's nutrient requirements. Animals should be fed a balanced diet and have unrestricted access to clean water.

4.1.2 Adjust stocking rates and/or supplementary feeding to ensure adequate water, feed and fodder supply

Due consideration should be given to the number of animals, physiological needs and nutrient quality of feeds when determining stocking rates, and all animals should have access to sufficient water each day.

4.1.3 Protect animals from toxic plants and other harmful substances

Protect animals from access to toxic plants and contaminated areas such as farm dumps. Do not feed animals mouldy feeds.

Store chemicals securely to avoid contamination of pastures, and observe withholding periods for pasture and forage treatments.

4.1.4 Provide water supplies of good quality that are regularly checked and maintained

Animals should have free access to a clean fresh water supply. Regularly clean water troughs or drinkers and inspect them to ensure they are fully functional. The water supply should be adequate to meet peak requirements. Drinkers should fill sufficiently quickly to avoid any animals in a group remaining thirsty. All reasonable steps should be taken to minimize the risks of the water supply freezing or overheating, as appropriate.

Runoff from effluent and chemical treatments of pasture and forage crops should not enter stock water supplies.

4.2 Ensure animals are free from discomfort

4.2.1 Design and construct buildings and handling facilities to be free of obstructions and hazards

Consideration should be given to the free flow of animals when designing and building animal housing and/or milking sheds. Avoid dead ends, and steep and slippery pathways. Ensure dairy buildings are safely wired and properly earthed.

4.2.2 Provide adequate space allowances and clean bedding

Avoid overcrowding of animals, even for short periods. Keep animal group sizes manageable and provide adequate feeding and watering space to reduce aggressive competitive behaviours.

Most dairy species have strong herding instincts. Group animals by similar weight and size if possible. Manage herd introductions to reduce fighting, particularly between mature and intact males.

Provide housed animals with adequate space for resting on comfortable bedding and protected from hard surfaces such as concrete. These areas should be kept clean (eg by replacing the bedding frequently). Grazing areas are usually suitable for resting, provided that they are rotated frequently and have adequate drainage.

4.2.3 Protect animals from adverse weather conditions and the consequences thereof

As far as practicable, protect animals from adverse weather conditions and the consequences thereof. This includes stress factors such as weather extremes, forage shortages, unseasonal change and others causing cold or heat stress. Consider shade or alternative means of cooling such as misters and sprays. In cold conditions shelter, such as windbreaks and housing, and additional feed should be provided. Permanent shelters with lightning arresters may be warranted in some areas. Have plans to protect dairy animals against emergencies (for example back-up power supplies) natural disasters (for example fire, drought, snow, flood); include provision of high ground in case of flood, provide adequate firebreaks and have evacuation provisions.

4.2.4 Provide housed animals with adequate ventilation

All animal housing should be adequately ventilated allowing sufficient supply of fresh air to remove humidity, allow heat dissipation and prevent build-up of gases such as carbon dioxide, ammonia or slurry gases.

4.2.5 Provide suitable flooring and safe footing in housing and animal traffic areas

Floors should be constructed to minimize slipping and bruising due to slippery or uneven floors. Excessively rough concrete or surfaces with sharp protrusions and stones can cause excessive wear or penetrations to the sole of the hoof, resulting in lameness. Unsuitable floors may inhibit mounting behaviours and lead to injuries. Protective floor coverings (eg rubber matting or other non-slip surfaces) can be used on walkways to reduce hoof abrasions that lead to secondary hoof infections.

4.2.6 Protect animals from injury and distress during loading and unloading and provide appropriate condition for transport

Transport can pose risks to the welfare of dairy animals. Ensure the loading and unloading facilities are adequate and that water is available in lairage if appropriate. Ensure the vehicle is suitably constructed to safely contain the animals, has good footing and adequate space allowances. Thoroughly plan longer journeys to ensure statutory welfare (feed, watering and resting) requirements are met.

4.3 Ensure animals are free from pain, injury and disease

4.3.1 Have an effective herd health management programme in place and inspect animals regularly

Animals should be regularly checked to detect injury and/or disease. Treatment and preventative herd health management programmes should be in place.

4.3.2 Do not use procedures and processes that cause unnecessary pain

People carrying out veterinary related tasks should be able to demonstrate competency, especially for procedures that could cause suffering for example disbudding/dehorning, castration, etc. Adhere to national regulations with respect to these and other practices (such as hot branding, tail docking, teat amputations, etc). Good hygiene is essential for surgical-type procedures. Consider alternative animal husbandry practices if appropriate.

4.3.3 Follow appropriate birthing and weaning practices

Develop an appropriate birthing plan that considers such issues as choice of sire (for ease of birthing); safe birthing facilities; and regular checking of animals to ensure prompt, experienced help is provided if required.

New born animals should be fed colostrum soon after birth. Wean young dairy animals once they are consuming sufficient dry feed.

4.3.4 Have appropriate procedures for marketing young dairy animals

Calves should not be offered for sale until sufficiently hardy to be transported. Adequate body weight and dry navel are good indicators. Appropriate transport conditions stipulated in national welfare regulations or codes of practice should be followed.

4.3.5 Protect against lameness

Laneways, yards, milking stalls and housing should be constructed to minimize the incidence of lameness. Regular hoof care management practices should be implemented and the animals' diets adjusted to minimise lameness. Lameness should be investigated to determine underlying causes and treated appropriately. Allow animals to move at their own pace.

4.3.6 Milk lactating animals regularly

Establish a regular milking routine appropriate to the stage of lactation that does not overly stress the animals.

4.3.7 Avoid poor milking practices as they may injure animals

Poor milking practices can affect animal well-being and production. Milking equipment should be well maintained and regularly serviced.

4.3.8 When animals have to be euthanized on-farm, avoid unnecessary stress or pain

When it is necessary to kill sick or diseased animals, or those in pain, it should be done promptly and in such a manner as to avoid unnecessary pain.

4.4 Ensure animals are free from fear

4.4.1 Consider animal behaviour when developing farm infrastructure and herd management routines

Good design of facilities to take advantage of the natural behaviours of dairy animals can enhance the movement of animals, reducing the number of negative interactions required by the stock handlers. Quiet, consistent handling practices using well designed facilities promote better productivity and safety from reduced fear and stress.

4.4.2 Provide competent stock handling and husbandry skills and appropriate training

Good stock handling and husbandry skills are key factors in animal welfare. Without competent, diligent care of animals their welfare will be compromised.

A competent operator should be able to:

- recognize whether or not the animals are in good health;
- understand the significance of a change in the behaviour of the animals;
- know when veterinary treatment is required;
- implement a planned herd health management programme, such as preventive treatments or vaccination programmes when necessary;
- implement appropriate animal feeding and grassland management programmes;
- recognize if the general environment (indoors or outdoors) is adequate to promote good health and welfare;
- have management skills appropriate to the scale and technical requirements of the production system;
- handle animals compassionately and in an appropriate manner; and
- anticipate potential problems and take the necessary preventive action.

Staff should be familiar with and comply with all relevant national regulations and key industry standards/assurance schemes relating to product quality/safety, etc. Staff should ensure records are maintained to demonstrate compliance with regulations or assurance schemes. People already involved in animal management/husbandry should keep themselves updated on technological developments that can prevent or correct welfare problems.

4.4.3 Use facilities and equipment that are suitable for stock handling

Ensure the facilities and equipment used to handle the animals are appropriate for the purpose, well designed and maintained. This can avoid injury to both people and the animals. Careful use of equipment can reduce fear in animals and make them easier and safer to handle. Monitor the animals' behaviour to identify aspects of the facilities or equipment that may provoke fear or be causing discomfort.

4.5 Ensure animals can engage in relatively normal patterns of animal behaviour

4.5.1 Have herd management and husbandry procedures that do not unnecessarily compromise the animals' resting and social behaviours

Most dairy species are gregarious animals. Use herd management and husbandry procedures that do not unnecessarily compromise their natural behaviours, for example herding, feeding, reproductive and resting behaviours. This also means sufficient space should be provided for these activities.

During the daily inspection(s) of animals, check for any abnormal behaviour. Ensure each animal has adequate space to feed appropriately and actually is feeding. Failure by an animal to feed may be an early indication of illness.

Mature and intact males should be managed and handled in a manner that promotes good temperament.

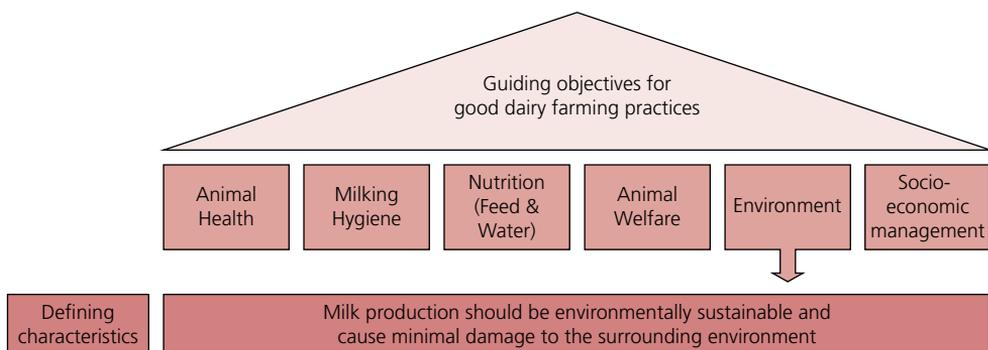
5. ENVIRONMENT

Increasingly, consumers are concerned that the production of food is sustainable and is undertaken in harmony with the environment. To meet these concerns it is important that dairy farmers produce milk in a way that meets the wider community's expectations, by using natural resources efficiently and minimizing any adverse impact on the environment.

Every dairy farmer can play a role in protecting their industry and the future of their enterprise by adopting management practices that enhance the environmental sustainability of their farming system.

The suggested good dairy farming practices for the environment are set out under the following headings:

- Implement an environmentally sustainable farming system.
- Have an appropriate waste management system.
- Ensure dairy farming practices do not have an adverse impact on the local environment.



5.1 Implement an environmentally sustainable farming system

5.1.1 Use farm inputs such as water and nutrients efficiently and sustainably

Some dairy farming systems rely heavily on external inputs such as irrigation water, fertiliser and feed. Dairy farmers need to consider the short and longer term impacts of using these resources on the land they farm. There may also be wider impacts on the local environment and/or community. Good dairy farming practice is aimed at improving productivity by using farm inputs efficiently and in a sustainable manner.

5.1.2 Minimise the production of environmental pollutants from dairy farming

Practices that manage the risks of environmental pollutants leaving the farm protect the surrounding environment and can also be good for the farm enterprise. Whilst nutrients may cause problems off the farm, they are a valuable resource on farms. The careful application of fertilisers and an effective effluent management plan will minimise off-farm impacts and can boost productivity.

Greenhouse gas emissions can be more difficult to control. Practices that improve productivity such as feeding a more digestible diet and applying fertilisers appropriately can

reduce methane and nitrous oxide gas emissions respectively, relative to the quantity of milk produced. Ensuring the nutrient requirements of both the plants and animals are met appropriately will help reduce/manage any potential nutrient losses.

5.1.3 Manage livestock to minimise adverse environmental impacts

Implement grazing and housing strategies that minimise environmental impacts. Fence off waterways and other sensitive areas from livestock.

5.1.4 Select and use energy resources appropriately

Dairy farmers should examine their farm's energy consumption and consider options to reduce it. Useful energy sources can be harnessed from dairy waste streams, such as effluent and waste heat from the milk cooling system or machinery. In some circumstances, non-renewable sources of energy such as electricity and fossil fuels, can be supplemented by renewable sources such as solar, biofuels, geothermal and wind derived energy etc.

5.1.5 Maintain and/or encourage biodiversity¹⁵ on the farm

Although most dairy farming is undertaken in highly modified environments, there are still opportunities to encourage biodiversity. Fence off sensitive areas such as water courses to exclude livestock. Set non-productive land aside as habitat for native plants and animals. Preserve remnants of the natural ecosystem by linking non-productive areas at the local level.

5.2 Have an appropriate waste management system

5.2.1 Implement practices to reduce, reuse or recycle farm waste as appropriate

Implement practices to reduce waste. Re-using and/or recycling are also good dairy farming practices. Many farms can reduce their water and energy consumption by properly maintaining equipment and infrastructure, or implementing minor changes to their work routines. Opportunities to recycle plastics, drums and other consumables should also be investigated.

5.2.2 Manage the storage and disposal of wastes to minimize environmental impacts

Waste storage areas such as manure heaps, slurry stores and farm dumps, should be sited appropriately, considering the local amenity with regard to sight and smell, and the risk to the environment from pollution and vermin. Regularly inspect permanent slurry stores and manure heaps for signs of leaks and impending structural failure to minimize the risk of runoff polluting the environment. Ensure other wastes such as waste milk, dead livestock, plastic silage wrap, farm chemicals and fertilisers are disposed of appropriately to prevent pollution of the environment and any potential disease issues. Potential breeding sites for flies and other disease carrying vermin should be eliminated.

¹⁵ Biodiversity or 'biological diversity' relates to the range of different life forms in an ecosystem. In the farm context it relates to the variation in life (animal, plant and other life forms) inhabiting the farm.

Develop a simple waste management plan to identify when, where and at what rate to spread manures, slurry and other organic wastes to minimize the risk of causing pollution.

Waste management plans should give due consideration to:

- compliance with local regulations or contractual obligations;
- avoiding possible pollution of watercourses, ponds, lakes, reservoirs, wells, boreholes, underground water from applying wastes to shallow soils and/or fissured rock;
- avoiding potential pollution of habitat areas such as woodlands, protected or recognized flora or fauna zones;
- ensuring that adequate buffer zones (non-spread areas) are maintained near vulnerable or sensitive areas such as water sources, habitat areas and the like;
- timing and level of application on sloped ground, heavy or impermeable soils and areas subject to flooding;
- optimum application levels on areas that already have a high soil fertility;
- current or impending weather and soil conditions at the time of application, such as frost, frozen ground, heavy rainfall and/or waterlogged soils; and
- national and regional environmental controls.

All organic manure wastes – including slurries – should be spread or incorporated into soil when there is minimal risk to the environment.

5.3 Ensure dairy farming practices do not have an adverse impact on the local environment

5.3.1 Contain dairy runoff on-farm

Dairy farmers should adopt systems that avoid the potential for the contamination of the local environment.

Storage facilities for oil, silage liquor, soiled water and other polluting substances must be located in a safe place and precautions must be taken to ensure that accidents do not result in the pollution of local water supplies.

Avoid disposing of agricultural or veterinary chemicals where there is potential for them to enter the local environment.

5.3.2 Use agricultural and veterinary chemicals and fertilisers appropriately to avoid contamination of the local environment

Protect the environment by only using approved agricultural and veterinary chemicals and medicines according to the directions on the label. Ensure the safe and secure storage of farm chemicals, preferably away from the milk storage areas. Ensure the safe disposal of expired and defective chemicals and chemical containers.

Consider biological and other non-chemical approaches to controlling farm pests, such as eliminating pest breeding sites. Apply integrated pest management practices where appropriate.

Apply fertilisers in a manner that minimises the risks of off-site nutrient impacts. Avoid using fertilisers that contain toxins, heavy metals or other contaminants. Ensure the safe disposal or reuse of empty fertiliser bags.

5.3.3 Ensure the overall appearance of the dairying operation is appropriate for a facility in which high-quality food is harvested

To limit the potentially adverse impact of dairying on the landscape and to provide a positive image of dairy production, dairy farmers should ensure that access roads to their farms and the farm surroundings are clean, sheds are correctly maintained and that access roads used by dairy animals are free of effluent. Care should also be taken to ensure that the dairy operation does not impact neighbours or the local amenity by controlling dust, smells, lights, noise, flies or other nuisances.

6. SOCIO-ECONOMIC MANAGEMENT

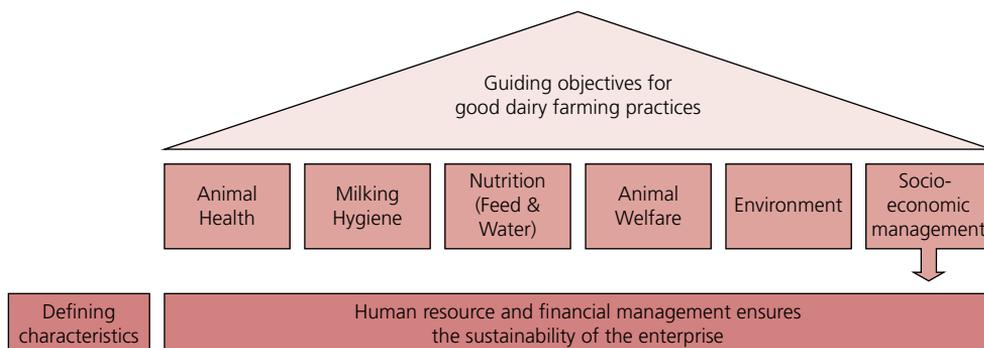
Being 'socially responsible' and 'economically sustainable' are integral to good dairy farming practice as they address two key risks to the farm enterprise.

Managing and looking after the farm's human resources is critical to the sustainability of the enterprise. In many parts of the world this will primarily apply to the farmer and others living on the dairy farm. However, dairy farmers must also consider the role their enterprise has in the wider community; as an employer, consumer of natural resources and its potential impact on neighbours.

Similarly, dairy farms are businesses producing a product, in this case milk, meat and livestock. Like all businesses, dairy farm businesses must be financially viable to have a long term future.

The suggested good dairy farming practices for the socio-economic management of dairy farms are:

- Implement effective and responsible management of human resources.
- Ensure farm tasks are carried out safely and competently.
- Manage the enterprise to ensure its financial viability.



6.1 Implement effective and responsible management of human resources

6.1.1 Implement sustainable work practices

Managing a dairy farm is a very demanding job. Even on a small landholder scale the dairy farmer is responsible for producing quality food from livestock that require daily care and attention. Dairy farmers need to consider their own health and welfare, and that of their families and farm workers. The workload of all should be reasonable and sustainable. Society has a duty to dairy farmers in this regard too, providing a fair return for farm produce.

6.1.2 Employ staff based on national laws and practice

Farm staff should be engaged on clearly defined and documented terms. Labour productivity is enhanced when dairy staff properly understand their duties, so a documented job description can be useful. Employment contracts must be lawful. Child labour is illegal in most countries and is inappropriate in dangerous environments.

6.1.3 Manage human resources effectively ensuring that their working conditions comply with applicable laws and international conventions

Dairy farmers and staff should ensure that they are able to cope with the physical and mental demands required by dairy farming.

Dairy farmers need to have realistic expectations of their staff. Forward planning through rosters and open communications play an important part in the productivity and safety of the workforce. Working hours must be sustainable and not exceed legislated limits.

6.1.4 Ensure the farm working environment complies with relevant occupation health and safety requirements

Farm equipment and infrastructure should not be a risk to the health and safety of farm staff and visitors. Good design and maintenance will remove many risks. Facilities must be provided to safely handle large dairy animals. Personal protective equipment, toilets and washing facilities should be provided where required. Consider vaccination for staff and/or animals to prevent zoonoses. Routine health assessments eg vision and hearing checks, may be useful.

6.2 Ensure farm tasks are carried out safely and competently

6.2.1 Have appropriate procedures and equipment in place for undertaking dairy farming tasks

It is important to ensure tasks undertaken on the farm are done safely, correctly and consistently by all farm staff. It is the dairy farmer's responsibility to ensure that farm staff are aware of and understand the procedures specific to their enterprise. They also need to clearly identify who is responsible for particular tasks.

It is good practice to have a written procedure, usually called a Standard Operating Procedure (SOP), which details how to carry out a task in a controlled and repeatable manner. It should cover all requirements to carry out the task, including details of process, equipment and materials, and any relevant risk and safety issues. It may be necessary to carry out a risk assessment on potentially hazardous tasks.

Clear procedures competently carried out minimise the risks to staff, animal health, animal welfare, and milk quality and safety.

6.2.2 Induct and train/educate staff appropriately for their work

Farm staff need to be properly trained to work productively and safely. This includes being formally introduced to the working environment and their specific role. New staff should be supervised by a competent person until they are familiar with their tasks and understand the farm's specific management systems and potential risks.

Training opportunities for existing staff can also improve productivity and increase work satisfaction. Training and educational opportunities can be used to monitor farm procedures and provide feedback for continual improvement.

6.2.3 Ensure staff carry out their tasks competently

Good managers have systems in place to ensure that tasks carried out by others on the farm are being undertaken competently and in a timely manner. Good communications,

backed up by visual checks, appropriate record keeping or other methods of verification, are good practice.

6.2.4 Choose competent people for training, advice and interventions

Choose competent and qualified people to develop and deliver staff training. Only seek and act on advice from sources and individuals that are appropriately skilled or qualified. Use appropriately qualified and authorised professionals to undertake specialist tasks on the farm such as veterinarians, milking machine technicians, dairy hygiene specialists, accountants and the like. In many regions the delivery of veterinary services is restricted by law to appropriately registered veterinarians to protect animal health and welfare and food safety.

6.3 Manage the enterprise to ensure its financial viability

6.3.1 Implement financial management systems

Most decisions that support good dairy farming practice have financial implications for the farm enterprise. Use records and book keeping systems that can provide the dairy farmer with up to date information about the farm's financial position. Access to this information underpins good decision-making.

6.3.2 Adopt agricultural practices that contribute to the productivity and/or profitability goals of the enterprise

Dairy farmers operate in constantly changing physical and market environments. Implementing good dairy farming practice is about being adaptive to change. Dairy farmers should implement new technologies and practices that are consistent with their goals. Examples include different fodder crop varieties or irrigation practices that are more appropriate to a changing climate. Feed and labour are significant costs to most dairy farm businesses and so improvements in these areas have the largest impact on the financial sustainability of the enterprise. Sustainable businesses are adaptive to change and are prepared to seize opportunities to improve their operations as they arise.

6.3.3 Plan ahead to manage financial risks

Forward budgeting of both farm income and expenses should be used to manage the financial risks to the farm enterprise. Budgeting can help identify and manage future cash flow issues, as well as minimise any financing costs.

FAO ANIMAL PRODUCTION AND HEALTH GUIDELINES

1. Collection of entomological baseline data for tsetse area-wide integrated pest management programmes, 2008 (E)
2. Preparation of national strategies and action plans for animal genetic resources, 2009 (E, F, S, R)
3. Breeding strategies for sustainable management of animal genetic resources, 2010 (E, F, S)
4. A value chain approach to animal diseases risk management – Technical foundations and practical framework for field application, 2011 (E)
5. Guidelines for the preparation of livestock sector reviews, 2011 (E)
6. Developing the institutional framework for the management of animal genetic resources, 2011 (E)
7. Surveying and monitoring of animal genetic resources, 2011 (E)
8. Guide to good dairy farming practice, 2011 (E)

Availability: October 2011

Ar – Arabic	Multil – Multilingual
C – Chinese	* Out of print
E – English	** In preparation
F – French	e E-publication
S – Spanish	
R – Russian	

The *FAO Animal Production and Health Guidelines* are available through the authorized FAO Sales Agents or directly from Sales and Marketing Group, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy.



Find more publications at
<http://www.fao.org/ag/againfo/resources/en/publications.html>

This second edition of the *Guide to Good Dairy Farming Practice* has been developed by an IDF/FAO Project Group of the IDF Standing Committee on Farm Management. It has been written in a practical format for dairy farmers engaged in the production of milk from any dairy species to support the production and marketing of safe, quality-assured milk and dairy products. The Guide focuses on the relationship between consumer safety and economic, social and environmental management at the farm level. Dairy farmers' production systems worldwide need to be able to combine profitability with the responsibility of protecting human health, animal health, animal welfare and the environment. This Guide gives individual dairy farmers proactive guidance on how these objectives can be achieved on their farm. The practices that are suggested have been drawn from best practice guidelines and existing assurance schemes around the world, and so individual practices will vary in their applicability to various dairying regions. They are not intended to be legally binding and readers are encouraged to select and implement those guidelines that are of relevance to their situation.

ISBN 978-92-5-106957-8 ISSN 1010-9021



9 7 8 9 2 5 1 0 6 9 5 7 8

BA0027E/1/08.11