

IndoDairy
Industri Susu Tangguh 2025



English Version

INDODAIRY: ESSENTIAL FARMING FACTS

2019



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English Version

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www.indodairy.net

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- For more information on the resources that contributed mostly to these factsheets, see: FAO (2015), 'The Golden Rules of Dairy Farming', Food and Agriculture Organisation, Rome, Italy. Available here: http://cdn.dairyasia.org/dairyasia/file/Golden%20Rule_English.pdf
- John Moran (2005), 'Tropical dairy farming: feeding management for small holder dairy farmers in the humid tropics', Landlinks Press.
- John Moran and Philip Chamberlain (2007), 'Blueprints for Tropical Dairy Farming: Increasing Domestic Milk Production in Developing Countries'. CSIRO PUBLISHING.

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Nutrition

1.1 Nutritional Requirements of Calves

- Always provide clean and fresh water to calves.
- After birth, colostrum should be fed to the calves as soon as possible. Ideally feed 4 litres within 6 hours, and no later than 24 hours after birth.
- The newborn calf should be fed approximately 10% bodyweight in milk daily, ideally 4–5 litres per day, and this volume is mostly maintained throughout the pre weaning period.
- If the newborn calf is weak and unable to suckle milk from dam then immediately feed ad libitum colostrum to calf with the help of a feeder.
- Introduce small quantities of high quality grain or concentrates (minimum 18% CP) from seven days after birth to drive rumen development.
- Wean the calf when it starts eating 1 kg concentrate daily, typically between 8-12 weeks. Or in Indonesia when the calf reaches approximately 90kg liveweight.
- Calves should be offered small amounts of high quality fibre (hay or straw) from three weeks of age. Optimum fibre length 1-2cm.
- Calves should be fed green fodder at the age of six week after birth.
- Heifers must be provided 1 kg of concentrate along with ad libitum green fodder on daily basis.
- Age of puberty can be reduced up to one year with this balanced nutrition.



Calves must be given a good drink of quality colostrum early in their lives. Each calf should receive 4 litres of colostrum within 6 hours of birth.

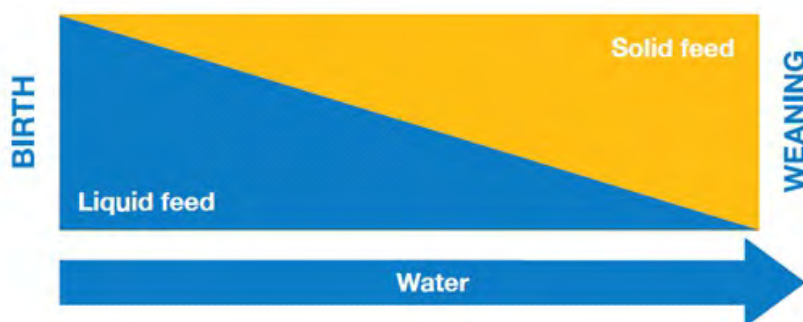


Calves can be weaned off milk when each one consumes about 1kg/day of calf concentrate. with the correct feeding management this should occur by 3 months of age.



Calves must be always provided with adequate clean drinking water

Source: FAO, Golden Rules of Dairy Farming, 2015



Source: Dairy Australia, Rearing Healthy calves, 2017

Calf Management



Calves housed in correct bedding/crate, clean with water and concentrate.



Calves housed in wet bedding/crate, unavailable drinking water and concentrate.

1.2 Nutrition of Weaned Heifers

- The key to feeding heifers is to ensure they achieve target weights with good frame development. Target liveweight varies for different breeds.
- Weaned heifers require a balanced diet and a variety of quality roughages and concentrates. This varies with the age of the calf.
- Calves can be weaned off milk when each one consumes ~1 kg/day calf concentrate, which should occur between 8-12 weeks of age. Or in Indonesia when the calf reaches approximately 90kg liveweight
- **Weaning to nine months of age** : Their rumen is still too small for them to only be fed roughages so also feed quality concentrates, of high energy and protein containing at least 16% CP for good skeletal and muscle development. Good growth rates are at least 0.7kg/day in Holsteins and 0.5kg/day in Jerseys
- **Nine months to joining at 15 months of age** : Require a diet lower in protein (14% CP concentrate) and energy density than younger heifers but require more feed. For a Holstein-Friesian the target weight at joining should be approximately 315-330kg at 15 months (for a 525-550kg mature cow).
- Desirable weight of a heifer at first calving should be 85% of mature liveweight.
- All dairy animals require regular access to clean drinking water.
- Well-reared heifers will show signs of heat within the first 10 to 12 months of life.
- If allowed to lose weight or grow very slowly for lengthy periods, heifers will not achieve their potential bone frame size and that can lead to problems in later life.
- Poorly reared heifers are stunted and often have a big 'pot belly'.
- Well-reared heifers will calve down at 24 to 27 months of age, not 30 or 36 months of age, as is generally the case in most Asian countries.
- During their lifetime, well-reared heifers will produce sufficient extra milk and calves to not only pay for their higher feeding costs but also yield substantial profits.



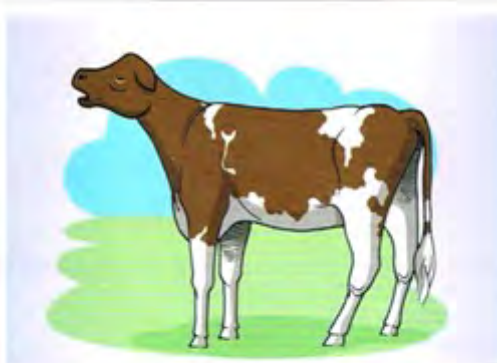
1. Weaned heifers require a balanced diet of quality roughages and concentrates. This varies with the age of the calf.



2. Their rumen is still too small for them to only be fed roughages so also feed quality concentrates, containing at least 16 to 18% protein. This could simply be good quality concentrate generally fed to milking cows



3. All stock requires regular access to clean drinking water



4. Well reared heifers will show signs of heat within the first 10 to 12 months of their life.

Source: FAO, Golden Rules of Dairy Farming, 2015

Target heifer liveweights on mature cow liveweights (kg) and wither height (cm) at first calving at 24 months					
Age (mths)	% mature weight	450kg (126cm)	500kg (130cm)	550kg (134cm)	600kg (137cm)
3	18%	81 kg (76cm)	90kg (78cm)	99kg (80cm)	108kg (83cm)
6	30%	135kg (88cm)	150kg (90cm)	165kg (93cm)	240kg (107cm)
15	60%	270kg (114cm)	300kg (118cm)	330kg (121cm)	360kg (124cm)
24	90%	405kg (127cm)	450kg (130cm)	495kg (134cm)	540kg (138cm)

Source: Dairy Australia, InCalf book, 2017

1.3 Nutritional Requirements of Milking Cows

- Milking cows have high requirements for water, which should be supplied ad libitum separately as clean drinking water rather than part of a concentrate slurry.
- Feed sufficient quality forages (20 to 40 kg fresh forage/cow/day).
The daily amount will depend on the cow's live weight, milk yield and availability of forages.
- Pregnant animals must be offered ad libitum green fodder up to 100 days in milk.
- Feed a maximum of 8kg of concentrate per cow per day to prevent acidosis.
- Feed better quality forage to cows in early lactation, and lower quality to mid-late lactation and dry cows.
- Wilt the forage, by leaving it out in the sun during the day before chopping it. This will reduce its moisture content, increasing feed intake to produce more milk.
- Harvest forages for maximum leaf and better quality (eg. Cut at 45-55 days of growth for King Grass/Elephant Grass for better quality).
- Ensure feed troughs are clean and remove old feed.
- Provide balanced nutrition feed and mineral mixture to protect animals from various metabolic disorders.
- Concentrate supplements should be formulated to provide sufficient energy, protein, minerals and vitamins for good milk yield and fertility.
- For cows in early lactation the diet should be 16-18% CP and energy requirements depending on liveweight, milk production and stage of pregnancy.
- Sourcing ingredients for concentrate supplements should be based on their relative costs of feed energy and protein.
- Dry off lactating animals for two months before parturition.
- At any one time, 60% of milking cows at rest should be ruminating. This is a good reflection of the overall good herd management, which includes appropriate feeding management.
- Closely monitor the manure characteristics to check if diet is unbalanced.



Feed sufficient quality forages in accordance with the cows' live weight and milk yield and the farmers' available forages resources.



Milking cows have high requirements for water which should be supplied separately as clean drinking water rather than as part of any concentrate slurry.



Consider wilting the forage, by leaving it out in the sun during the day before chopping it up, to reduce its moisture content and encourage the cows to eat more of it, hence produce more milk.

Source: FAO, Golden Rules of Dairy Farming, 2015

Feed Sufficient Forages



1.4 Producing High Quality Forages

4

Basic principles of producing quality forages. These are:

1. Select the most appropriate forage species for the region.
 2. Prepare the forage production area for sowing.
 3. Manage the crop, particularly with adequate fertiliser to optimise growth and quality.
 4. Harvest the crop at the best stage of maturity for nutritive value.
- Important climatic factors affecting forage adaptation are the length of the growing season, air temperatures, soil fertility, soil pH and drainage.
 - Growing forages requires additional inorganic fertilisers as well as cow manure and shed effluent.
 - The seasonality of rainfall and soil temperature does not allow for regular growth of forage crops throughout the year.
 - High growth rates during the wet season provide the opportunity to harvest excess forage for conserving to be fed out during the dry season when forage sources are in short supply.
 - Harvest height will affect the quality of forage cut, generally the taller the forage the higher the fibre content and lower energy (such as King Grass).
 - Excess forages can be conserved as hay or silage.
 - Good ensiling practices generally produce better quality roughages than do hay because less time is required to wilt the feed.
 - Hay making requires a longer period of rain-free days, which are often rare in the tropics during the wet season when feed excesses generally occur.

1.5 Silage Making

- Excess forages can be conserved as hay or silage and conserved to feed at a later time. Silage is forage or crop residues preserved by acids, either artificially added or produced by natural preservation, in the absence of air.
- During wet season, the tropical forage species grow very fast, providing an opportunity to conserve more for the dry season.
- Forage for silage should be harvested at an optimum quality, as feeding it fresh. Napier grass (king grass) should be harvested following 30-40 days regrowth in wet season, about 75-150cm in height for optimum quality.
- Native roadside forages should be harvested when leafy and contain no prickly species. Tree legumes should be cut while leaves are green with minimal twigs or branches.
- Silage can be stored in small plastic bags, plastic or steel drums, in pits and in stacks above ground. Store drums in the shade.
- The steps to silage making are:
 - 1) Harvest the forage (king grass or maize) when excess and in high quality
 - 2) Wilt the forage to 35% dry matter
 - 3) Chop the forage into short lengths (1-3cm) before ensiling
 - 4) Add a fermentable substrate at ensiling such as molasses (at 3-5% on wet basis)
 - 5) Compact the forage as tightly as possible into the bag or container
 - 6) Complete the storage as quickly as possible after filling
 - 7) Maintain airtight seal until feeding out
- The fermentation phase begins once oxygen is gone and can last several days to weeks, and if successful will reduce the pH to 3.5-4.5
- It is important to maintain an airtight seal around the silage and repair holes as soon as they are noticed to prevent spoilage.
- If the silage gets hot and turns dark, do not feed.
- Do not feed any silages that contain mould or fungi.
- Trial making small batches initially.



For more information on nutrition, see :

Dairy Australia (2013), Heifers on Target Guide, available here:

www.dairyaustralia.com.au/heifersontarget

Dairy Australia (2017), 'Rearing Healthy Calves', 2nd Edition, Available here:

<https://www.dairyaustralia.com.au/-/media/dairyaustralia/documents/farm/animal-care/animal-welfare/calf-welfare/rearing-healthy-calves-manual-2nd-ed.ashx>

FAO (2015), 'The Golden Rules of Dairy Farming', Food and Agriculture Organisation, Rome, Italy.

Available here: http://cdn.dairyasiasia.org/dairyasiasia/file/Golden%20Rule_English.pdf

John Moran (2005), 'Tropical dairy farming: feeding management for small holder dairy farmers in the humid tropics', Landlinks Press.

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A photograph of two black and white cows in a wooden stall with a corrugated metal roof. The cows are eating green grass. The cow on the left is in the foreground, looking towards the camera. The cow on the right is slightly behind it, also looking towards the camera. The stall has wooden beams and a corrugated metal roof. There is some text on the wooden beams, including "WIONY" and "14R-18-00-BIP".

Husbandry and Reproduction

2.1 Calf Health and Rearing

- Calves must be born under hygienic conditions. Calving cows must be provided with a clean dry area in which to calve down.
- Calf records should be taken including information on calf birth weight, date of birth and pedigree.
- The calves' umbilical cord should be sprayed with iodine solution (7%) immediately after birth.
- Calves must be given a good drink of quality colostrum early in their lives. Each calf should receive 4 litres of colostrum within 6 hours of birth.
- Calves must be always provided with adequate clean drinking water.
- A healthy calf needs to drink about 6–7.5% of its bodyweight in milk daily to avoid becoming dehydrated. For an average dairy calf in the first 14 days of life this is about 4–5 litres per day.
- Separate calves for first 3 weeks of life, preferably off the ground. Calf pens should always provide clean, dry, comfortable and well-ventilated housing for better growth of calves. Calves should be housed away from drafts but with good ventilation.
- Always untie calves and provide them free access to water and feed.
- Calves can be weaned off milk when each one consumes ~1 kg/day of concentrate. With the correct feeding management, this should occur by approximately 12 weeks of age. Or in Indonesia when the calf reaches approximately 90kg liveweight.
- Tagging of calves and record keeping is very important to assess growth rate, health and productive performance.
- Dehorning of calves at an early age prevents injuries and losses and this practice leads to an increased sale price for these animals. Disbudding is best done between 2-4 weeks.
- Removing extra teats immediately after birth results in easier milking later in life.
The most common health problem seen in young calves is diarrhoea (calf scours). The pathogens that cause scours are generally spread via calves ingesting faeces directly or consuming liquid or feed contaminated with faeces.
- Scouring calves should be given electrolyte fluid replacer. Give antibiotics only under veterinary advice.
- Diarrhea often occurs when lacking colostrum and poor hygiene and is best treated with electrolytes.



Calves must be born under hygienic conditions. Calving cows must be provided with a clean dry area in which to calve down.



The calves' umbilical cord should be sprayed with iodine solution (7%) immediately after birth.

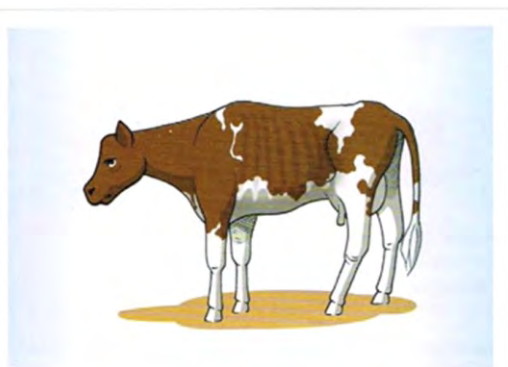
Source: FAO, Golden Rules of Dairy Farming, 2015

2.2 Breeding Adult Cows

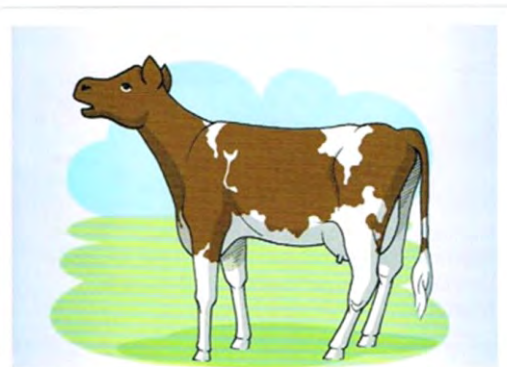
- Better reproduction is achieved through a balanced nutrition.
- Age at puberty can be reduced by up to one year through proper management and balanced nutrition.
- Feed ad libitum green fodder along with concentrate ration and mineral mixture to achieve desired results of animal reproduction.
- Milking cows need to be well fed to rebreed. If cows are too thin or over fat, they will have poorer fertility.
- It is important to dry cows off in the body condition that they will calve. Varying amounts of concentrate can be fed in late lactation to achieve target BCS of 2.75 - 3.25 when drying off.
- Heat detection should be done on a regular basis in the morning and evening.
- Look for signs of heat 18 to 24 days after their last heat if they are still non-pregnant.
- Sign of heat include standing to be mounted by other cows (but difficult to see if tied), restlessness or bellowing, or mucus around the vulva.
- It is possible that a cow does not show signs of heat, known as a silent heat which could be due to illness, hoof problems or being in poor condition.

Artificial Insemination (AI)

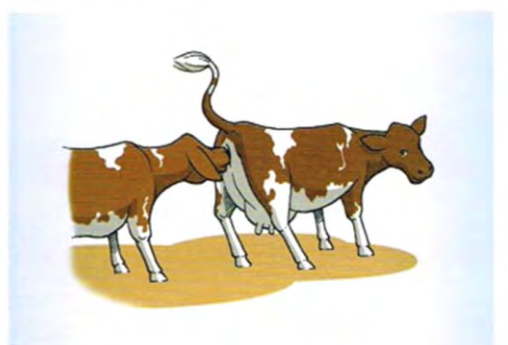
- The best conception rates occur with insemination (natural or artificial) 4 to 12 hours after the first signs of heat.
- Artificially inseminate the animal within 24 hours after onset of heat signs.
- With artificial insemination, it is important to use insemination technicians with reliable good inseminating skills and use semen that has been tested as good quality.
- It is important to keep good records of heats and inseminations to ensure good herd reproductive performance. This includes records of the date mated, bull or straw number.
- The target submission rate is that 80% of cows inseminated by 80 days (after calving) and aim for less than 2.5 inseminations per pregnancy
- It may be necessary to cull additional cows if more than 15% of the herd have more than 16 months between calvings
- Each month farmers should identify non-pregnant cows that have calved more than 80 days before but not detected on heat to be checked by a veterinarian for reproductive tract abnormalities.
- Some cows will have had a heat that was not detected, which in this case can be injected with prostaglandin (PG).



Milking cows need to be well fed to rebreed. If cows are too thin or over fat, they will have poorer fertility.



The voluntary waiting period, or days between calving down and rebreeding, should be no more than 50 or 60 days.



Look for signs of heat 18 to 24 days after their last heat, if they are still non-pregnant



The best conception rates occur on insemination (natural or artificial) 4 to 12 hours after the first signs of heat.

Source: FAO, Golden Rules of Dairy Farming, 2015

Artificial Insemination (AI)

- One of the biggest challenges when rebreeding cows is to feed them an adequate well balanced diet in early lactation (the first 100 days of their lactation).
- Early pregnancy diagnosis should be done by expert veterinarian after 60 days of AI
- Chronically ill non-profitable animals should be culled from herd.

Repeat Breeding

Animals that show heat signs regularly but fail to conceive after insemination cause additional economic loss to dairy farmers. There are many reasons of repeat breeding which include:

- Nutritional and mineral deficiency
- Severe weather stress
- Artificial insemination services from inexperienced technician
- Improper timing of artificial insemination after heat signs
- Use of poor quality and expired semen
- Harmful effects of various infectious diseases
- Complications of reproductive disorders i.e. metritis and pyometra

2.3 Animal Health

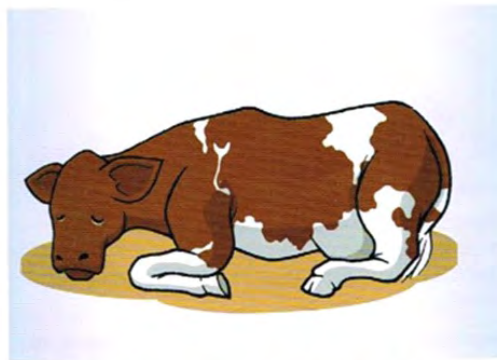
- Disease prevention includes good hygiene, isolation of stock and a regular vaccination program.
- Learn to quickly identify sick animals from their physical appearance and behaviour.
- If an animal is obviously sick, then move it to an isolation pen in order not to infect other stock.
- Lameness can be a major problem with cows living in sheds due to trauma, unbalanced diets or overgrown hooves. Cows under heat stress will stand more to cool down, which can increase lameness problems.
- Providing cows with soft bedding, such as a dry soil or sand resting area, or rubber mats improves cow comfort as well as reducing feet and leg problems.
- Consider hoof trimming if the claws appear overgrown, and provide footbaths with copper sulphate.
- Sore feet can be due to feeding problems (acidosis) and if identified, rumen buffers and additional forages should be fed.
- A written herd health program should be developed that contains management actions for herd health to prevent and control diseases and disorders.
- Do not use old drugs that are past their use by date to treat sick animals.
- Drugs should only be used as a last resort to complement a well-managed system.
- Keep the hospital pen clean and occasionally sterilised.
- Parasites that infect cows include:
 - ectoparasites (live outside body): ticks, flies, lice, mange, fungus (e.g. ringworm)
 - bacteria (pink eye), viruses (warts)
 - endoparasites (live inside body): intestinal worms, lung worm, liver fluke
 - tick and insect-borne diseases: theileriosis (East coast fever), babesiosis, anaplasmosis, bovine ephemeral fever (three day sickness), trypanosomiasis.
- For endoparasitic infections, anthelmintics are given regularly at least every three months.
- For all parasite infections, advice must be sought from a veterinarian.

Cow Health After Calving

- Cows with problems at calving have an increased risk of infection of the reproductive tract.
- Cows that have twins, assisted calving, stillborn calf, retained foetal membranes (RFMs), vaginal discharge after calving and abortion have increased risk of infection in the reproductive tract (uterus).
- Some health problems affect the reproductive tract directly (such as RFMs and vaginal discharges) while others reduce feed intake leading to rapid body condition loss and anoestrus (such as lameness and ketosis).
- Metabolic disorders such as ketosis, milk fever and acidosis are usually linked to low intakes around calving or abrupt changes in diet. Managing nutrition well during the dry period and in early lactation is the key to preventing or minimising the occurrence of metabolic disorders.
- Infections can persist for weeks or months after calving, and can reduce reproductive performance and can take time for the cow to heal. Veterinarian should be consulted and treatment may include antibiotics or prostaglandin (PG) 21-28 days after calving and again 14 days later.
- It is important to keep good records and have a planned approach for treatment and prevention.



Develop a disease prevention plan that includes good hygiene, isolation of stock and a regular vaccination programme.



Learn to quickly identify sub-clinically sick animals from their physical appearance and behaviour.



If animal is obviously sick, then move it to an isolation pen in order not to infect other stock.

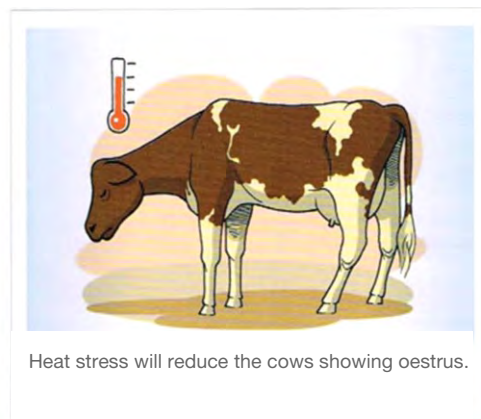


Lameness can be a major problem with cows living in sheds. As it can be due to trauma or an unbalanced diet, its cause must be identified.

Source: FAO, Golden Rules of Dairy Farming, 2015

2.4 Heat Stress Management

- To keep cool, cows will stand up to increase air flow around its body. Open mouth breathing, and excessive drooling are all signs of prolonged heat stress. This requires urgent attention.
- As temperatures rise about 25 degrees, a cows starts to actively regulate its body temperature and above this the cow becomes uncomfortable.
- Hot cows lose their appetites, which will reduce feed intake and milk production. Feed better quality forages to higher producing cows as they will need extra energy to keep themselves cool.
- Milk production drop is usually the most noticeable effect of heat stress.
- Heat stress will reduce the number of cows cycling and showing oestrus. This will decrease conception rates.
- Heat stress will reduce a cow's fertility and if severe (especially greater than 30 degrees), can result in embryonic death.
- It is better to feed cows during the night, when it is likely to be cooler, as well as early in the day.
- Extra water is essential on hot days or during summer for the cows to lose any extra body heat.
- Sheds with low roofs and walls (which obstruct the wind) will reduce natural ventilation.
- Comfortable and dry bedding should be provided so cows can lie down.
- Spraying water on hot cows, even with a hose for just a few minutes, followed by placing them next to a fan (or better natural ventilation), will cool a hot cow. The water should be sprayed over the cow's trunk, enough to run off the cow's hide.
- Heat stress can be monitored through counting the number of breath she takes (respiration rate).
- If the number of breaths is more than 70 or 80 per minute, the cow is heat stressed and needs extra attention. If the cow is breathing at more than 100 per minute or panting, she is very heat stressed and requires immediate attention.
- Increasing air movement, even just using simple household fans, will improve cow cooling rates.
- Changing shed design will increase cow comfort, such as providing a gap in the ridge line to allow hot air to escape for better air circulation. Provide wide enough sheds to prevent sunlight entering and also wetting the tin roof will provide extra cooling.



Source: FAO, Golden Rules of Dairy Farming, 2015

2.5 Housing Dairy Stock

- Animals should be provided an open, well ventilated, clean and comfortable shed for better production and reproduction.
- Shed direction should be from north to south to prevent extreme weather conditions.
- Cows should be able to lie down and rest for 10–12 hours/day, on comfortable and dry bedding. This increases salivation, rumination, blood flow to the udder and hence milk yield. It also reduces lameness.
- Shed floor should be non-slippery and there must be proper drainage of water.
- Always provide clean and fresh water to animals and water troughs must be in shaded area. The optimal trough height is 60–90 cm from the ground to the top of the trough.
- Feed troughs should be designed to have a base no more than 10 cm above the ground. They should have smooth bottoms and not rub on cow's necks when eating.
- Stock must be provided with sufficient drinking water at all times and the system should be able to supply at least 20 L/cow/hr to meet likely peak demand. A water depth of 15–20 cm helps keep water cooler, fresh and easier to clean.
- Cows tied up all day every day on concrete floors, and resting on dirty hard floors are not comfortable. A free stall set up, not tethering cows is better for cow health, welfare and production.
- Cows with hindquarters covered in fresh and dry manure are not comfortable.
- Cows need to be allowed to walk around and 'stretch their legs' every day or so. This regular exercise decreases leg-related problems, mastitis, bloat and calving difficulties.
- Rubber matting on concrete floors will help make cows more comfortable.
- Cows that have difficulty lying down and standing up because their tie rope is too short are not comfortable.
- For free stall shed designs, size of the cubicles depends on cow size. For cows:
 - weighing 400–500 kg, they should be 104–109 cm wide and 198–208 cm long
 - weighing 500–590 kg, they should be 109–114 cm wide and 208–218 cm long
 - weighing 590–680 kg, they should be 114–122 cm wide and 229–244 cm long.
 The surface of the free stall should have a consistent fall of 2%.
- If possible, install fans in shed to protect the animals from heat stress
- Shed cleaning should be done at least twice a day for prevention of various diseases.

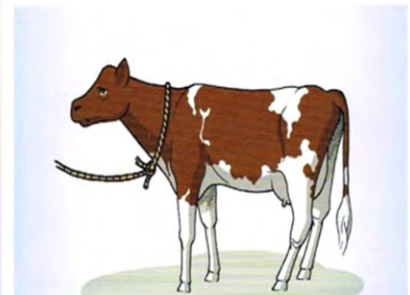
- Dairy farm effluent is both a liability and an asset. It is a liability as it can contaminate feeds, encouraging flies and animal health issues, but can be a fertiliser asset to apply nutrients for forages.
- Each day a cow produces 30–35 kg faeces and 12–16 kg urine plus shed effluent from washing down floors.
- Floors should be made from concrete or easily washable material. They should be designed for efficient drainage with a good slope with wide channels for easy urine and faeces removal.
- A manure pit should be dug, large enough to hold the shed's manure produced over 2 or 3 days. A channel should be dug leading from the walking area to the pit and lined with concrete.
- The pit should be covered with a plastic sheet or banana leaves to reduce the sunlight, and volatilisation of nitrogen in the manure, reducing its value as a fertiliser.
- Provide equipment to handle solid effluent and liquid effluent, such as a pump and pipes that lead directly to the forage area.
- Consider an area to dry manure for bricks or cooking fuel or set up a system for biogas.



Cows need to 12 to 14 hours of undisturbed rest each day preferably in comfortable stalls.



With well-designed walkways and resting stalls, comfortable lying surfaces and non-slip walking surfaces, cows suffer less lameness, can behave more normally and suffer less stress, have higher daily milk yields and longer productive lives.



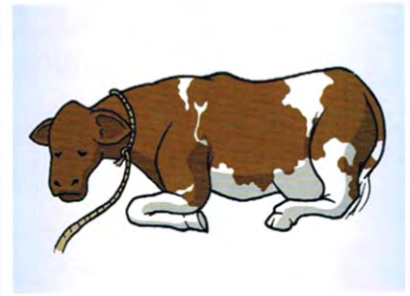
Cows tied up all day every day on concrete floors are not comfortable.



Cows with hindquarters covered in fresh and dry manure are not comfortable.



Cows forced to continually lie on dirty hard floors when resting are not comfortable



Cows that have difficulty lying down and standing up because their tie rope is too short are not comfortable

Source: FAO, Golden Rules of Dairy Farming, 2015

2.6 Body Condition Scoring

- Body condition scoring (BCS) is a visual assessment of the amount of fat and muscle covering the bones of the cow.
- BCS is a measure of a cow's energy (and protein) reserves, based on a previous level of feeding and likely future feed requirements.
- Effective management of body condition and nutrition improves herd reproductive performance, milk production, feed conversion efficiency, and enhances cow health and welfare.
- Different systems are used to body condition dairy cattle.
- For Indonesia a 5 point scale
 - A cow with BCS of 1 is considered extremely thin, the result of under feeding or disease
 - A cow with BCS of 5 is considered extremely fat and at risk of several metabolic diseases after calving.

How to body condition score a cow

1st Observation

How sunken is the area between the tail and pins?

Deeply Sunken



Sunken



Slightly Sunken



Filled In



2nd Observation

Are the insides of the pins hollow?

YES



NO



1.75

2.00

Is the backbone a bumpy sharp ridge?

YES



NO



2.30

2.75

The depression between the hip and pin is:

U-SHAPED



3.25

SHALLOW



3.50

FLAT



3.75

Targets

At calving and drying off between BCS 2.75 - 3.25

Adapted from Dairy Australia, Body Condition Scoring Handbook, 2013



Adapted from Dairy Australia, Body Condition Scoring Handbook, 2013

For more information on animal husbandry and reproduction, see :

Dairy Australia (2013), 'Body Condition Scoring Handbook'.

Available here: https://www.dairyaustralia.com.au/farm/animal-management/fertility/body-condition-scoring?section=cow_body_conditioning_scoring_handbook#accordion-1

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Milk Quality and Hygiene

3.1 Mastitis and Its Prevention

- Mastitis is one of the biggest problems for smallholder dairy farmers throughout South-East Asia.
- Mastitis badly affects the quantity and quality for milk. Delayed or improper treatment can lead to teat loss and economic loss of dairy farmers
- Older cows are more susceptible to mastitis.
- Causes of Mastitis
 - Unhygienic condition of shed
 - Unhygienic milking practices
 - Neglecting and mishandling of teat and udder injuries
 - Calf suckling after milking
- Signs of clinical Mastitis
 - Red, hot, swollen and painful udder
 - Reduction in feed consumption and high fever
 - Significant reduction in milk production and appearance of flakes in milk
 - Milk of affected animal has bad odour
 - Improper and delayed treatment may cause teat fibrosis which results in damage of one or more than one quarter of udder
- Signs of sub-clinical Mastitis
 - No apparent change in udder confirmation
 - Animal seems healthy however delayed milk let down and decline in milk production
 - No flakes appears in milk but taste of milk becomes saltish
 - Teat become fibrosed and this condition may remain sub-clinical for months and years
 - Sometimes watery or pus-like discharge oozes out from teat
- Recommendations for prevention of Mastitis
 - Clean the shed twice a day. Keep milking buckets clean
 - Wash and dry udder before and after milking
 - Avoid incomplete milking and keep the thumb up-ward during hand milking
 - Each milking cow should be provided with a separate cloth (or paper towels) to clean the udders and teats before milking. It should then be washed in hot water, sterilised and hung up to dry in the sun before using at the next milking
 - Cows' teats should be sprayed or dipped in 7% iodine solution following milking.
 - After milking keep the animal standing for at least 30 minutes so that the teat canal can be sealed off. This can be achieved by feeding each cow after milking.
 - Try to prevent mud and dirty water into entering the teat canal
 - Separate the affected animals and milk them at the end
 - Before dry-off, the pregnant animals use long acting intra-mammary antibiotics
 - Always provide balanced nutrition to animals for effective immunity against mastitis and other infectious diseases
 - The California Mastitis Test (commonly called CMT) should be undertaken on each milking cow once each month until the herd reaches a low level of mastitis. Then it can be undertaken every three months.
 - For further information contact with qualified veterinarian



Demonstration of the surf field test to detect sub-clinical mastitis.

Another method of mastitis is the surf field mastitis test which may be easier to use in the field

- This is a simple and cheap test used to diagnose sub-clinical mastitis:
- In order to diagnose sub-clinical mastitis, this test should be repeated every 15 days.
- Mix 2-3 teaspoons of household detergent in a cup of water.
- Collect milk streaks from individual teats in four separate cups.
- Add an equal volume of surf solution in each cup and mix thoroughly by tilting/rotating the paddle tray gently for 30 seconds. Observe the appearance of the mixture to determine the degree of mastitis.

Small white flakes	1st degree	(+)
Thick flakes	2nd degree	(++)
Jelly-like consistency	3rd degree	(+++)
Milk remains unchanged	No Mastitis	

3.2 Producing Quality Milk

- Poor milk quality reduces the shelf life of liquid milk (that is pasteurised or ultra high treated or UHT).
- Milk quality refers to the bacterial contamination in the cow's udder or the milking equipment whereas milk composition refers to constituents such as fat, protein, calcium and solids-not-fat.
- The most important point for producing quality milk is hygiene, both while milking the cows and handling the milk from the cowshed to the milk collection centre.
- Milking staff should have clean hands and clothes, have no obvious signs of sickness and preferably use gloves.
- When cleaning the udder prior to milking, use a different clean cloth for each cow or paper towels, ensuring that any infected teats are cleaned last.
- No smoking during milking or near the milk collection.
- It is best to have a dedicated milking area, keeping other animals away from this area.
- During milking make sure correct hand milk techniques are used and that each teat is stripped out.
- Milking utensils should be thoroughly cleaned with detergent and hot water, sanitised and hung upside down to drain and dry out before the next milking.
- Use of stainless steel milking buckets are recommended.
- Milk should be delivered to the milk collection centres in the shortest time possible time possible to maintain the best quality.





Poor milk quality reduce the shef life of liquid milk (that is pasteurised or ultra high treated or UHT) and is becoming more important for smallholder dairy farmers.



The most important point to produce quality milk is hygiene; both while milking the cows and handling the milk from the cow shed to the milk collecting centre.



Milking staff should have clean hands (and clothes), have no obvious signs of sickness and preferably use gloves.



Milking utensils should be thoroughly cleaned with soapy water, followed by hot warer, sanitised and hung upside down to draing and dry out prior to the next milking.



Each milking cow should be provided with a separate cloth to clean the udders and teats prior to milking. It should then be washed with soap and running watet, sterilised and hung up to dry in the sun prior to using the next milking



Cow's teats should be sprayed or dipped in 7% iodine solution following milking. Your local veterinarian or dairy cooperative should be able to provide this iodine solution.

Source: FAO, Golden Rules of Dairy Farming, 2015

For more information on milk quality, visit :

FAO (2015), 'The Golden Rules of Dairy Farming', Food and Agriculture Organisation, Rome, Italy. Available here: http://cdn.dairyasia.org/dairyasia/file/Golden%20Rule_English.pdf

John Moran and Philip Chamberlain (2007), 'Blueprints for Tropical Dairy Farming: Increasing Domestic Milk Production in Developing Countries'. CSIRO PUBLISHING.

A woman wearing a purple hijab and a floral-patterned long-sleeved shirt is kneeling in a barn, milking a large cow. The cow has a distinctive coat with white, black, and brown patches. A large metal bucket is positioned on the floor to collect the milk. The barn has a wooden roof with visible rafters and a corrugated metal floor. Sunlight filters through the open side of the barn, creating strong shadows.

Business Management

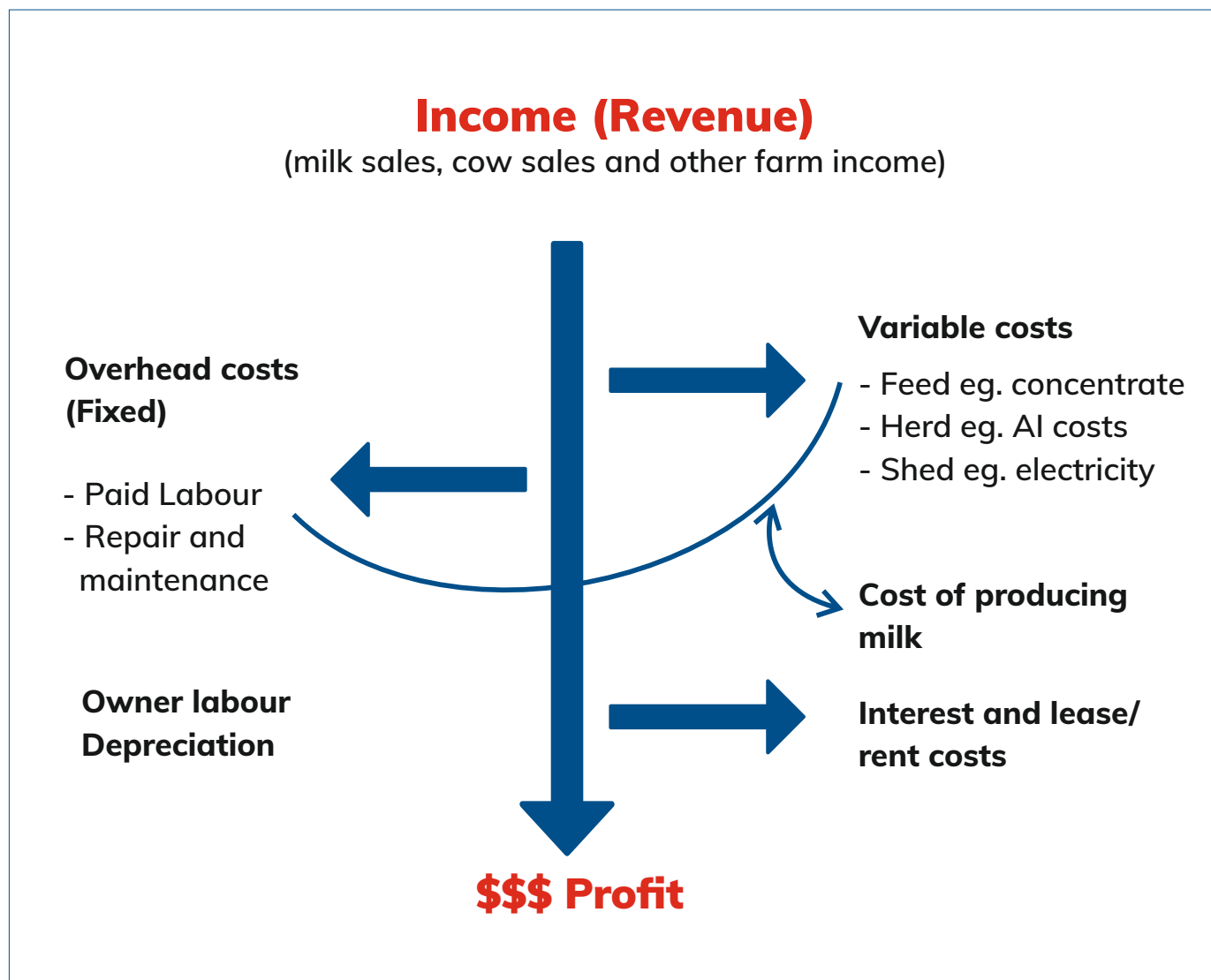
Why do we want to analyse the farm business?



- Understand farm profitability
- Understand what parts are contributing to profit
- What are the opportunities to improve
- Build wealth and consider changes to the farm e.g. expansion
- The largest cost to a dairy farm are feed costs and a large influence of profit.
- Optimising feed costs will help to maximise profit.
- The key to farm business analysis is good record keeping, to understand costs and calculate farm profit. Monthly recording can include revenue sources (from milk or other) and costs (feed, herd and shed costs) to calculate profit.
- Total expenditure on milk production is called cost of production. For profitable dairy farming, it is very necessary to regularly and keenly analyse these expenditure and adopt effective strategies.

4.1 How to Calculate Profit

- Farm profit is a measure of financial performance
- Profit = revenue (income) – costs
- The most important income stream for a dairy farm is milk income. In addition income may be generated from animals sales (calves, bulls or cows), manure or value added products.
- Variable costs are costs to the dairy farm that typically vary in relation to the number of cows being milk which includes:
 - i) Feed costs (concentrate, by product, costs of forage production, fuel, bought in fodder)
 - ii) Herd costs (AI, veterinarian costs, calf rearing, medicines)
 - iii) Shed costs (water, electricity, farm supplies such as rubber gloves, buckets etc.)
- Fixed or overhead costs are those costs that do not vary as much a result of changes in activity and are costs needed to operate a business. These include :
 - i) Cash overhead costs which involve actual payments, such as employed labour, repairs and maintenance and other farm administrations costs such as insurance.
 - ii) Non cash (imputed) overhead costs, or hidden costs because no cash changes hands. This includes family labour where the farmer and family work the farm but don't pay themselves for labour. Depreciation of farm equipment, which involves the cost of the equipment when it must be replaced.
- Labour is another important cost to a farm, and its performance can impact on profit.
- Labour efficiency can be measured as total labour cost per unit of milk production
 Labour cost (\$)/ litre or per cow. Or as the number of full time labour (paid and unpaid)
 = Full time equivalents (FTE) such as FTE/ no. cow or FTE/ milk production (e.g. litre)
- Milk income less feed costs (MIFC) is another financial indicator, aside from profit that can useful to measure and provides a guide to how well the cows are being fed.
- $MIFC = (\text{milk income}) - (\text{feed costs for milking cows})$
- It does not take into account the costs of feeding the non-productive stock on the farm, namely the dry cows and replacement heifers.



For more information on farm business management, visit :

John Moran and Philip Chamberlain (2007), 'Blueprints for Tropical Dairy Farming: Increasing Domestic Milk Production in Developing Countries'. CSIRO PUBLISHING.

INDODAIRY: ESSENTIAL FARMING FACTS

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www.indodairy.net

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This series of factsheets detail technical dairy information
to support extension officers and service providers in the areas of
dairy cattle nutrition, animal husbandry and reproduction, milk quality and business management.

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