

Assessing current farm management practices

This chapter presents a framework for assessing current farm management practices.

The main points in this chapter

- There are a series of key performance indicators that provide realistic targets of farm performance following improvements in feeding, herd and farm management.
- The average milk production of all the lactating cows can provide a useful guide as to the adequacy of the current dairy farm management practices.
- This chapter presents six key task areas with which to assess current farming skills: feed production, feeding management, herd management, housing, milking management and general farm management.
- These could provide a framework for grading the suitability of farmers to receive imported high-quality dairy stock.

Imported dairy stock require a high level of herd and farm management to ensure they continue to grow well and remain healthy to become productive milking cows. Poor management practices can lead to low growth rates, delayed breeding, stock diseases and even deaths among imported stock, both before and after first calving.

It is important to assess the quality of management on each dairy farm prior to the introduction of these stock to help decide on the farm's suitability to be included in such a dairy improvement and importation scheme. A series of checklists to consider when assessing current herd and farm management practices is provided below. This is followed by one approach to assist in this evaluation process. Prior to working through the checklists, a new approach has been documented to provide a guide to the adequacy of current farm management practices.

The dynamic nature of dairy farming makes it difficult to develop a simple set of criteria with which to assess current management skills. The term key performance indicators (KPI) has been derived to describe a series of measures of dairy farm performance with which to provide realistic targets following improvements in feeding,

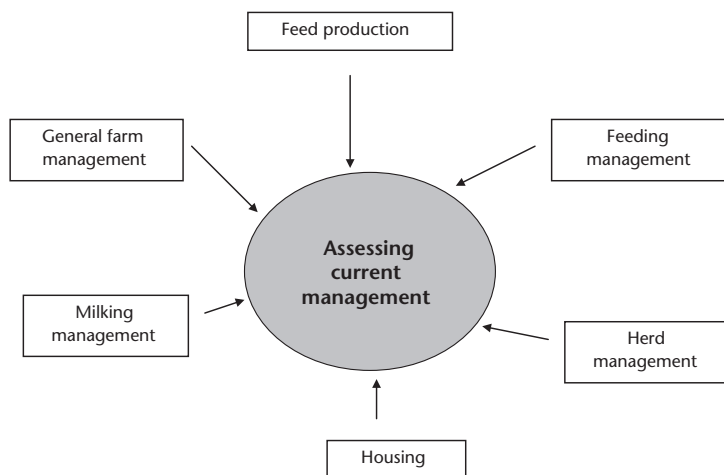


Figure 18.1. The framework to assess current farm management practices

herd and farm management. Such a set of KPIs for SHD farming were developed for one of my previous books (Moran 2009a) and has more recently been presented in a specific publication (Moran 2009b), which is freely available from the author (contact jbm95@hotmail.com). This publication contained a summary table of the 10 key measures of SHD farm performance, which is presented in Table 18.1. It is beyond the scope of this chapter to provide more details than is in this table.

18.1 Using current cow milk yields to assess adequacy of the current farm management

All these KPIs can be quantified to provide guidelines as to which ones require priority in any dairy farm improvement program. Although some are relatively easy to quantify, others are quite difficult. Probably the most simple, and most used, single measure of SHD farm performance is the average milk yield of the milking cows. The correct term for this figure is ‘rolling herd average’ because it is the average milk yield of all the lactating cows, which will be at various stages in their lactation cycle.

This single value provides a summation of all the important aspects of SHD farm management, so any interpretation must take into account a diversity of feeding, herd and farm factors. Accordingly, many dairy specialists may query its usefulness as a single measure of dairy farm performance. However, it is routinely used by farmers to describe their farm’s performance in relation to their neighbour’s farm and also in relation to production targets provided by many government advisers. In addition, it is often quoted by government officials when summarising the stage of development of their national dairy industries. Table 18.2 attempts to describe the adequacy of a dairy farm’s management practices using the rolling herd average; other factors to consider are listed in section 18.1.1.

Table 18.1. Ten key measures of dairy farm performance

Measure	Description
Feeding management	
1. Stocking capacity	Is the farm carrying too many stock for the available forage supplies?
2. On-farm forage production	How much of the farm's annual forage requirements must be purchased?
3. Forage quality	Is the forage being harvested or purchased at its optimal quality for milking cows?
4. Concentrate feeding program	What is the quality of the concentrates being fed and how much is allocated per milking cow?
5. Total feed costs	Are the forages and concentrates costing too much per MJ of energy or kg of protein?
6. Milk income less feed costs	How does this compare with those of other farmers with good feeding management?
Herd management	
7. Proportion of productive cows	What is the percentage of adult cows actually milking? What is the proportion of milking cows in the entire dairy herd, expressed as a percentage?
8. Pattern of milk production	What is the peak milk yield of the herd and what is its lactation persistency (rate of decline from peak milk yield)?
9. Reproductive performance	How many days after calving do cows cycle? What are the herd's submission and conception rates? What are the herd's 100 day-in-calf and 200 day-not-in-calf rates?
10. Heifer management	What is the calf mortality rate and the wastage rate from birth to second lactation? What is the age and live weight at first calving of the replacement heifers?

Table 18.2. Interpreting the adequacy of dairy farm management from cow milk yields. Range in average herd milk yields on tropical South-East Asian dairy farms.

Herd milk yield (kg/cow/day)	Adequacy of dairy farm management practices
5	Very poor feeding and herd management and low genetic merit cows (or milking buffalo)
7	
9	Typical of many SE Asian small holder farms, even with high grade Friesians
11	Gradual response with grade and crossbred Friesian cows to improved feeding, herd, young stock and shed management. Milk yields of 15 kg/day are considered acceptable by many government dairy advisers.
13	
15	
17	
19	
20	Potential level in lowland humid tropics following improved management of body condition throughout lactation
25	High genetic merit cows in tropical highlands or lowland dry tropics with good farm management
30	Typical peak milk yields in herds with 25 kg/cow/day rolling herd averages
35	Unrealistic in SE Asia, except where all major constraints to milk production have been overcome

18.1.1 Other factors to consider

- It is important to differentiate between rolling herd averages and peak milk yields.
- Milk composition should be considered as an indicator of feeding management, for example:
 - low milk fat can indicate possible sub-clinical rumen acidosis
 - high milk protein can indicate good dietary energy intake
 - milk lactose levels are fairly constant.
- Excessive body condition is indicative of low protein diets, due to:
 - the inability of cows to partition nutrients from body reserves to milk synthesis
 - poor fertility because cows cannot easily cycle, hence conceive.
- Very poor body condition is indicative of low energy intake because:
 - high genetic merit cows preferentially partition body reserves to milk synthesis
 - cows will not cycle due to excessive weight loss.
- Herd dynamics can also indicate adequacy of dairy farm management:
 - excessive number of dry non-pregnant cows can indicate very poor farm management
 - a low percentage of lactating adult cows can also indicate poor farm management.

18.2 A checklist to assess current farm management practices

For easier interpretation of overall farmer skills, the nine farm activity areas listed in Chapter 1 have been reduced to six by:

- combining young stock, disease and reproduction management and stock welfare into one 'herd management' category
- introducing an additional 'general farm management' category to take into account the farmer's business management skills.

These skills/farm activities are described in sections 18.2.1 to 18.2.6.

18.2.1 Feed production

- size of forage production area (in m²)
- types of forages grown on the farm (grasses, legumes, cash crop by-products)
- quality of forage at harvest
- fertiliser management (manure, inorganic fertilisers)
- forage harvest interval (during wet and dry seasons)
- fodder conservation practices (silage, hay)
- year-round supplies of fodder (dry season sources)
- number and type of stock on the farm (milking cows, dry cows, heifers, calves)
- stocking capacity (too high, optimum or too low?)
- proportion of forages from home-grown supplies
- proportion of forages sourced off farm
- types of forages sourced off farm.



Workshop participants assessing the farmer's facilities for milk rearing his dairy heifer replacements.

18.2.2 Feeding management

- typical daily allocation of fresh forages (? kg fresh forage/milking cow/day) in wet and dry seasons
- forage preparation (wilting, chopping)
- hand or machine chopping of forages
- type of concentrates fed (formulated, by-products, knowledge of energy and protein supplements)
- vitamin and mineral additives (type, others fed)
- allocation of concentrates (? kg/kg milk produced)
- measures of cow milk production (peak milk yield, current milk yield, days in milk)
- pattern of milk production (rate of decline from peak milk yield)
- body condition at calving, mating and drying off
- knowledge of cow live weights and changes in body condition scores (mating and calving live weights).

18.2.3 Herd management

- milk-fed calf management (colostrum feeding, milk feeding program, weaning age, calf mortality)

- source of milk (whole milk, calf milk replacer)
- treatment for scours (use of antibiotics versus electrolytes)
- calf pens (type, cleanliness)
- weaned heifer management (concentrate feeding, mating age, age at first calving)
- visual assessment of condition of calves and heifers
- disease management (vaccination program, veterinarian support and animal health program, drug storage, protocol for treating scours, milk fever and other diseases)
- reproductive management (heat detection, routine pregnancy testing, calving interval, conception rate)
- breeding program (criteria for selection of sires)
- lameness (locomotion test)
- mastitis (incidence, routine California mastitis tests, management and control programs)
- climatic environment (monitor respiration rates, outdoor access at night)
- structure of dairy herd (proportion of productive cows in milking herd, proportion of productive cows in entire herd)
- record keeping (board in shed, note book, computer)
- what records are maintained
- target setting (daily milk yield, long-term herd size)
- welfare issues (stock transport, any obvious problems)
- surplus stock (disposal, growing out male stock)
- other sources of dairy income (manure, excess fodder, biogas).

18.2.4 Housing

- shed design (floor slope and comfort, roof height, ventilation)
- access to water (adequate, continual)
- climate control (temperature and humidity inside shed, sprinklers, fans, varying feeding management during year)
- shed cleanliness (layout for cleaning, frequency of cleaning)
- cow stalls (tie stalls or loose housing, free stalls, sufficient lounging area)
- milk feeding calf pens (crates, deep litter, can easily separate calves, cleanliness)
- grouping of milking cows based on stage of lactation (yard for heat detection)
- pen layout inside shed (for young stock, hospital pen for isolation)
- location of milk-fed calf pens away from adult cows
- feed storage facilities (separate to stock area, bird, insect and vermin proof, mixer for concentrates, chopper for forages)
- services (insulation, electricity, water for washing down, hot water for calf feeding equipment)
- catering for personnel (suitable space and furniture for relaxing, lockable storage for drugs)
- effluent disposal (size of manure pit, how frequently emptied).

18.2.5 Milking management

- separate milking area (good layout for machine milking)

- hand milking (personal hygiene, milking method, type of and cleanliness of milking bucket)
- machine milking (cleanliness, quality and replacement of rubber liners)
- milk storage (milk cooler, stored in cool location)
- milking hygiene (hot water, soap, sanitisers, store buckets and milk cans upside down)
- milk quality and unit return (percentages of fat, SNF or protein, bacterial contamination, milk grade, expressed in local currency units/kg milk).

18.2.6 General farm management

- record keeping (board in shed, note book, computer) and sufficient office space
- extent of record keeping (cow production only, performance of all stock, all farm inputs, labour)
- systematic record keeping (accessibility, kept in logical format, is it referred to in future?)
- extent of financial records (occasionally revisited, relationship with creditors)
- knowledge of costs of milk production (? local currency units/kg milk produced on farm)
- short-, medium- and long-term plans for farm
- making good use of service providers (free information, awareness of all services)
- efficiency of using employed and family labour
- communication and management of paid labour
- milk marketing (member of dairy cooperative, considered value adding, sought all possible market outlets)
- Subjective assessment of overall farm management skills.

18.3 Grading farmer skills

Using this structured approach to assess farm management could provide a framework for grading the suitability of individual farmers to receive imported high-quality dairy stock. For example, the following set of criteria was developed for a herd improvement program in Central Java in 2008, using a grade of good, average or poor, with some objective and others subjective.

18.3.1 Objective criteria

- **Average milk yield per cow:** above 12 kg/day, good; 10–12 kg/day, average; below 10 kg/day, poor.
- **Price for existing milk produced** (because this entails milk quality and composition): above 3000 Rp/kg, good; 2500–3000 Rp/kg, average; below 2500 Rp/kg, poor.
- **Fresh forage supplies (grass, cassava leaf, etc.) in the wet season:** above 30 kg/day, good; 20–30 kg/day, average; below 20 kg/day, poor.
- **Record keeping:** daily production, artificial insemination (when), when veterinarians visit and for what disease, when and what vaccination, from where the stock originate, their predicted calving dates. If the farmer writes the details down and remembers, good; if he remembers but does not write them down, average; if he does not know or remember, poor.

18.3.2 Subjective criteria

- **Condition of cow shed:** size, ventilation, condition of floor, hygiene (where is the manure pit?).
- **Herd management:** condition of dairy cow (health, weight, body condition), condition of young stock (health, weight for age, body condition), reproduction (calving interval).
- **Milking management:** equipment, hygiene, post-harvest milk handling.

The above example was developed specifically for a dairy development program for one region in Java, predominantly based on introducing high genetic merit stock both from within Indonesia and imported from Australia (Moran 2008). Because current levels of farm management were suboptimal, the standard of the grading scores were not high. This would probably need to be revised when developing a grading score for dairy development schemes in other regions outside Central Java.

This scheme was developed for a dairy adviser workshop in which participants visited several farms to assess their current levels of farm management. This provided a focus for group discussions on the level of farm performance required for them to make the best use of imported stock and the magnitude of current constraints for farmers to achieve acceptable levels of herd performance and farm profits.