Trends in milking systems

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Twice daily milking is an essential task for the dairy farmer and the speed of milking influences the time available to him for other work and to the cows for extra grazing.

In order to minimise operator fatigue with its undesirable consequences, and return cows to grazing within a reasonable time it is generally accepted that milking should take a maximum of 1½ to 2 hours. A reduction in labour employed in milking is also essential to improve the economics of dairy farming.

Modern milking systems can greatly contribute to these requirements by allowing the owner-farmer to handle a greater number of cows unaided, or in other situations to release labour from the shed for other work.

The following review leads from the better known basic sheds to the most modern types.

Back-out and walk-through dairies

Early sheds were the back-out bail type and some are still in use. They were followed by the walk-through systems which improved cow movement, and which still include about half the sheds in the main dairying areas of Western Australia.

Due to the amount of walking required within the shed and individual handling of cows the throughput is low—about 35 cows per man-hour for one-operator sheds and 26 for two-man sheds.

Herringbone dairies

Herringbone sheds, originally known as "Echelon" sheds, once had cows and operators on the same level, the cows entering in batches and standing in herringbone formation. Tried in Australia about 50 years ago, they were not favoured and did not progress.

During the 1950s interest in herringbone sheds grew when a change in design permitted stoopless milking, and yarding systems improved. The introduction of radial back ing gates greatly speeded up the batch entry of cows. The first modern herringbone shed in W.A. was opened in 1957 but progress was slow for some years.

Advantages in cow throughput have since swayed many farmers to the extent that about 50 per cent of sheds in the main areas of W.A. are herringbone types. Bail feeding, which is not recommended, has been discontinued by many farmers, so speeding up their work. Average throughputs are about 50 cows per man-hour for one operator and 34 for two operators, but many sheds exceed these figures.

The most modern version of the herringbone is the square type, one of which is operating in Victoria with 24 sets of teat cups. Two operators average 65 to 70 cows per man-hour.

The herringbone dairy in various forms has become established as a very economical and efficient system and will remain a popular shed in the foreseeable future.

Rotary dairies

Rotary dairies were the subject of a recent Victorian Department of Agriculture survey as they were gaining popularity and were due for assessment against other recognised systems.

Rotary dairies offer some advantages over other types, such as a great reduction in walking and idle time for operators. They are also more adaptable to some forms of automation such as cup removal and feeding of concentrates where desired.

The first rotary dairy in Australia was the "Rotolactor" installed at Camden, N.S.W., in 1952. This is a sophisticated and costly installation and expense appeared to deter farmers from rotary dairies for some years. During the last five years considerable progress has been made following the invention of simpler designs such as the New Zealand "Turnstyle" and rotary herringbone types, two of which are Australian designed—the Victorian "Minilactor" and the South Australian...
Design principles of milking areas of some dairies

WALK THROUGH

direction of rotation

breach rail

2nd operator

breast rail

1st operator

HERRINGBONE

direction of rotation

TURNSTYLE

ROTARY HERRINGBONE TYPES

CROUSEL

man exit
“Rotella”. In W.A. the first rotary dairy was opened in July, 1972, and four are now in use, all the “Turnstyle” design.

Modern rotary dairies in Australia

A number of registered designs of rotary units have been installed in the Eastern States within the last two years. They are either fabricated by the designers or under licence and transported to and installed in the farmers’ sheds.

“Turnstyle”

Designed in New Zealand, the basic form of the Turnstyle accommodates 16 cows which move directly onto and remain facing the centre of the elevated platform, and back off after milking. The platform moves intermittently to allow entry and exit of cows. Automatic feeding can be incorporated. As the application and removal of teat cups is done from the outside of the platform, two operators are required. Because they work on the outside at floor level they have good control over the entry of cows. The throughput of this model is about 50 to 60 cows per man-hour. When automatic teat cup removal becomes an acceptable proposition one man could operate the dairy with greatly increased throughput.

In New Zealand, units have been designed for one-man operation with an odd number of stalls moving two at a time. The cows do two revolutions and the cups are removed when the cows pass the operator the second time.

Turnstyles are also made to accommodate 28 cows with two-stall movement but seem to require three operators, resulting in a similar throughput to the smaller unit.

In New Zealand there are further adaptations including a set-up where two platforms are operated by three men. One man is positioned between the two platforms to remove teat cups. Throughput figures are about 67 to 80 cows per man hour.9

“Minilactor”

Designed in Victoria, the Minilactor consists of an elevated, continuously rotating platform which accommodates 13 cows in herringbone formation. It is equipped with automatic feeding and cows are secured in position by automatic head-lock bails. The operator works at floor level inside the ring platform and attends to all milking operations.

The Minilactor is designed for one-man operation but is largely dependent on a voluntary flow of cows to the platform, so that good yard and gate design, including a movable backing gate, are essential. Once milking starts it is not easy for the operator to leave the pit, but observations have shown that the need is rare. The platform can be stopped at will when necessary. With a good operator the Minilactor can attain a throughput of about 100 cows per man-hour.

“Rotella”

Designed in South Australia, the Rotella is also a continuously rotating elevated ring type platform which accommodates 15 cows for one-man operation or 20 for two operators. It is equipped with automatic feeding and cows are automatically secured in herringbone formation by an ingenious, but simple, swivelled toggle bar which is activated by each cow as she takes up position. The operation of these dairies is similar to the Minilactor. A throughput of about 100 cows per man-hour can be attained by an efficient operator in a one-man shed.

“Carousel”

An English design for one-man operation, the Carousel consists of an elevated ring type platform with the operator in the centre similar to the rotary herringbone types. However, the platform is stopped and started with a foot switch when movement is required. It accommodates eight cows in tandem formation, each being contained in a separate side entry compartment.

Cows may be fed automatically on an individual basis by a computer system available with this design. One of these dairies has been installed in South Australia and the throughput is 70 to 80 cows per man-hour.

Discussion

The size of the dairy-farming enterprise and the hired labour requirement must be taken into consideration when selecting a size and type of dairy. However, as herd size has increased dramatically in the last decade and is still increasing, no farmer should choose a walkthrough shed.

A herringbone should be the first choice of the simple static dairies because of the much greater throughput and ease of handling cows for a shed of given dimensions.

The selection of a rotary dairy calls for more thought because the additional cost for a one-man dairy could be $6,0002 depending on location, franchise and transport cost for the rotary equipment. However, this extra investment could result in doubling the throughput per man-hour which in turn could result in a lower wages bill—or the profitable use of labour elsewhere on the farm.

Fast throughput of cows is important in terms of labour utilisation but the stage may ultimately be reached where a breakdown in efficient milking affects production per cow, and the production of clean milk. Before this stage is reached the farmer must assess the situation—should he slow down a little or milk more cows to compensate?

It would be logical to adopt the first alternative to reduce the proportion of feed being used for maintenance only, particularly if his pasture stocking rate is optimal. Also the lifetime effects of poor milking practices may reduce any advantages attained by milking extra cows. Irrespective of throughput, a reasonable standard of husbandry must always be maintained to at least minimise the incidence of mastitis and produce clean milk.

References