FUTUREDAIRY information sheet

Breeding for automatic milking

by Peter Williams and Kendra Kerrisk

The main breeding objectives are generally similar for herds milked in a conventional dairy and those in a pasture-based automatic milking system (AMS). However managers of AMS herds may place more emphasis on some conformation traits that influence the robot's ability to attach cups and the cow's ability to walk voluntarily around the farm. Consideration may be given to cow size, udder, legs and rump. To improve these traits, select high Australian Profit Ranking (APR) cows from the *Good Bulls Guide* paying particular attention to cow size, udder, legs and rump.

Cow size

Medium-sized cows are favoured to handle increased walking distances and are considered to be more efficient in a pasture-based AMS. In a feedlot AMS, where walking distances are not so critical, farmers may prefer to breed for larger sized cows.

The Australian Breeding Value (ABV) for stature can be used to determine if a bull's daughters are medium or larger sized.

Udder

FutureDairy experience shows that robots are capable of attaching cups to most cows, regardless of their udder conformation and teat placement. When herds move to AMS, very few cows need to be culled due to udder or teats being incompatible with robotic cup attachment.

However, good udder conformation and teat placement will make robotic cup attachment more efficient, freeing up the robots for more milkings. So it's worth considering when making breeding decisions.

Robotic cup attachment is more efficient if teats are positioned in the centre of the rear quarters rather than towards the outside or inside of the lobes.

Ideally front and rear teats should not be positioned too wide or angled. With the increased emphasis over many years of bringing rear teats closer together, herds may be trending toward close rear teat placement resulting in the potential for the rear teats to angle and cross over. This would make robotic cup attachment difficult. To widen the distance between rear teats, select bulls from *The Good Bulls Guide* with a Rear Teat Placement ABV of less than 100. Avoid excessively long or short teats.

The ideal udder for an AMS also takes into consideration the desire to breed level-floored udders rather than tilted udders. Cows with excessive tilt should be considered as potential culls.

Legs

The walking distance in any pasture-based grazing system requires that cows walk freely and are willing to do so. This is even more important in an AMS where cows move voluntarily around the farm without human intervention. Any lameness or predisposition to lameness can see a lower motivation to walk and increase risk of loitering.

When making breeding decisions for AMS herds, pay attention to selecting sires for sound feet and legs. Consider rear set, foot angle and rear leg rear view.

Rear set

To increase the set (curve) of the leg, select bulls from The Good Bulls Guide with a Rear Set ABV of greater than 100.
To straighten the set (curve) of the leg, select bulls from the Good Bulls Guide with a Rear Set ABV of less than 100.

Foot angle

To increase foot angle, select bulls from The Good Bulls Guide with a foot angle ABV of greater than 100.
To reduce foot angle, select bulls from The Good Bulls Guide with a foot angle of less than 100.

Rear Leg Rear View

To improve the tracking of legs (when viewed from the rear), select bulls from The Good Bulls Guide with a rear leg rear view ABV of greater than 100.

Rump

For AMS herds, aim for correct rumps that slope from hip to pin (select bulls with a Pin Set ABV of more than 100). This improves the position of the thurl and associated rear leg attachment. It encourages positive locomotion with the rear legs tracking in a straight line rather than swinging or hocking-in.

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For more information

ADHIS Tech Note 14: Teat Placement ABV, available on www.adhis.com.au

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About FutureDairy

FutureDairy is an R&D program to help Australian dairy farmers manage the challenges they are likely to face during the next 20 years.

As one of the big challenges is the availability of labour and the associated lifestyle issues, FutureDairy's focus is on automatic milking systems, or 'robotic milking'. While robotic milking technology is now in wide use overseas, there's less experience with automatic milking in grazing-based farming systems such as in Australia.

FutureDairy's research is investigating the real impact of automatic milking on labour, reproductive performance and voluntary cow traffic, especially in larger herds.

In addition, we support farmers and their advisors to adapt their farming systems to automatic milking. As well as training advisors, we develop tools and resources for farmers and provide direct support through group activities, on-line communication and individual advice when needed.

Sponsors

FutureDairy is a collaborative project based at the University of Sydney's Camden campus. Sponsors include Dairy Australia, DeLaval, the University of Sydney and the Department of Primary Industries, NSW.

Previous work by FutureDairy

FutureDairy started in 2004, exploring opportunities for productivity gains by substantially increasing forage and feed production and utilisation on farm and technological innovations with the potential greatest impact on farmers' lifestyle labour management.

There were two key areas of investigation: development of farming systems for automatic milking within a grazing system and development of complementary forage rotations. We explored how our findings work under commercial conditions through partner farms. This allowed us to study how technical issues are affected by 'people' issues that can make a difference between a technology being used on-farm or not.

From 2008 to 2011 FutureDairy focused on two key areas: Feedbase and Precision Farming (AMS and other technologies). A major initiative was working with DeLaval to co-develop the 'robotic rotary', an innovative automatic milking system designed for large herds and Australian dairying systems. We also developed farming systems based on complementary forages. We put our recommendations from our research to the test by working with DPI NSW to assist farmers in the Hunter Valley in implementing complementary forage systems on their farms.

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