NITROGEN EFFICIENCY ON DAIRY FARMS

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FutureDairy's research has found that a complementary forage system (CFS) achieved the most efficient use of nitrogen at the 'whole farm level,' compared with other dairying systems used around the world.

A CFS involves allocating a portion of the farm to intensive forage production to increase productivity from home-grown feed. It usually involves growing forage crops, sometimes double or triple cropping. Crops are selected to complement each other. For example they may include a legume for nitrogen fixation, a bulk crop such as a cereal or maize for silage, and a brassica (forage rape) to break pest and disease cycles.

FutureDairy project leader, Associate Professor Yani Garcia, said the research – conducted by postgraduate student, Santiago Farina – measured the nitrogen efficiency for FutureDairy's CFS farmlet study and compared the results with other dairy systems studied throughout Australia and internationally.

The CFS in FutureDairy's trial at Camden near Sydney involved allocating 35% of the farm for double or triple cropping, with the rest of the farm used for intensively managed pasture.

Under this CFS, 45% of all nitrogen entering the farm was converted into milk. This compares with an average of about 26% for Australian dairy farms* and about 16% overseas.**

"At 45% nitrogen efficiency, FutureDairy's complementary forage system converted more than one and a half times the amount of nitrogen into milk than the average for Australian dairy farms," said Assoc Professor Garcia.

The key to the nitrogen efficiency of the CFS the higher amount of milk produced from home-grown feed. This came from the combination of the bulk crop (eg maize) and a legume crop and the fact that the pasture area in the CFS had high yields (20 t DM/ha) given the leven of nitrogen fertiliser applied (250kg/ha).

Overall the CFS utilised 24.8 t DM/ha/year which meant that the nitrogen entering the farm as bought-in feed was minimised with cows receiving about 1t DM concentrates/cow/lactation.

Compared with other intensification systems such as relying heavily on purchased feed, the CFS has a lower potential environmental impact, in terms of producing more milk per unit of nitrogen entering the farm.

"The CFS gives dairy farmers another option for increasing their farm productivity in a sustainable way," Assoc Professor Garcia said.

For more information, contact Associate Professor, Yani Garcia, FutureDairy, ph (02) 4655 0621 email sergio.garcia@sydney.edu.au or www.futuredairy.com.au

* Data from Accounting for Nutrients project, a 2-year national study that monitored 41 dairy farms across all Australian dairying regions.

** Based on farm studies from seven countries measuring N balance with the same critiera as the FutureDairy trials.