UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

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DAIRY NEWS

Finding a balance on Valley dairies

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One of the fundamental challenges facing the dairy industry in the Central Valley of California will be to quantify the nutrient flow in each dairy farm, particularly nitrogen (N). Environmental legislations has made it necessary for dairy producers to be able to quantify and adjust N use in their farms. Different research papers indicate that it is difficult to measure the various N losses from farms on a routine basis, and strategies to control one type of loss (e.g. ammonia volatilization) often lead to increase in a different loss (e.g. nitrate leaching). Thus, whole nitrogen balance is often considered as a means to estimate unaccounted for N that can became a hazard to the environment, and also to implement the necessary strategies to decrease the losses to the environment. In other words, complete records of total farm N inputs (feeds, fertilizers, bedding, etc) minus N outputs (milk, animals, manure, feeds, etc) will help dairy producers to identify possible areas to improve the efficiency of N utilization, decrease losses to the environment, and to comply with new environmental regulations.

The minimal time to run a whole nitrogen balance is one year. This might be considered as a critical point or the first step for many dairies. In most of the cases, producers keep records and it would be possible to run whole nitrogen balances with the information from recent years, if not, it is highly recommended to begin keeping records. A dairy farm will be in balance when the ratio between the N Inputs and N Outputs is approximately 2:1. That means, if in one farm the outputs of N in milk, feeds, animals, and manure represent less than 50% of total N Inputs some changes needs to be done to close the balance. For example, reducing the number of heifers to other farms, exporting dry manure as compost, increasing the forages production to consume more manure, decreasing feed purchases and fertilizers, maximizing the production of N in milk, etc. These changes if they are necessaries must be carefully planned between dairy producers and his advisers to reduce possible negative impacts on the system economy.

The University of California Cooperative Extension is also working on other two basic tools to improve the efficiency of nutrients utilization. They are: (1) how to apply manure to minimize losses and improve forage production, and (2) how to feed animals to maximize N conversion to animal products. To minimize losses to the environment, manure needs to be applying at agronomic rates, or according to the N content in manure, soil, and the crops consumption. Respect to feeding management, information from more that 50 dairies in Merced County indicate that dairy producers are doing an excellent job in terms of animal nutrition. But, new technologies can be applied on high yielding dairy cows to improve efficiency of N utilization decreasing N excretion. Clearly, mass or whole nutrient balances are the critical step, and represent a big effort from dairy producers.

West Nile Virus –
How Dairies Can Help "Fight the Bite"

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West Nile Virus is here in a big way! The South Valley leads the state in the number of human cases of WNV. As of July 29th, 56 cases of human WNV infections had been identified in California. Nearly half of those human cases were in Kings, Tulare and Kern counties. The first death in California related to West Nile this year occurred in Kings County on July 21st.

WNV is transmitted by mosquitoes. Mosquitoes acquire the virus when they feed on infected birds, which are the natural host. Although most birds infected with WNV do not suffer any illness, some get sick and die. An increase in the number of dead birds can be an indication that WNV is present. Local, state and federal agencies have been sampling dead birds for the presence of WNV since it first arrived in California in 2003. During the last two weeks of July 2005, half of the 731 dead birds collected statewide tested positive for WNV. Many of those were from the South Valley.

Infected mosquitoes can spread the virus to people or animals. Most people who are bitten by an infected mosquito will not become sick and those that do usually only develop flu-like symptoms. In some cases, a more serious neurological condition in humans leading to disability or even death can develop. Animals can also acquire WNV from infected mosquitoes, but few develop disease. Horses are the exception. Last year 540 WNV cases were reported in horses. Nearly half of those died or had to be euthanized.

Dairies can do their part to help curb the spread of WNV by eliminating mosquito breeding sites. Mosquitoes need quiet, standing water to successfully reproduce (see life cycle that follows). Manure storage ponds on dairies can become a significant source of mosquitoes. The good news is that ponds can be managed to prevent mosquito breeding. For many years local mosquito abatement districts have sprayed dairy ponds for mosquito control. Unfortunately, storage ponds choked with weeds and manure solids are difficult or even impossible to spray.

Weeds provide sheltered water for mosquitoes and they also prevent larvacide sprays from reaching the surface of the water. Floating solids can support growth of weeds and also restrict wind action on the pond surface. Weeds are the easiest to deal with. The best course of action is to control weeds on pond walls with herbicides or soil sterilants early in the spring. If that fails (or more likely never gets done) vegetative growth must be sprayed with herbicides. Any weeds, dead or alive, that are at or near the water's edge must be removed.

Floating solids and sandbars are more problematic. Most dairies constantly struggle to keep solids from entering ponds by various means not so much for mosquito control, but because solids reduce storage volume. Solid separation systems aren't perfect and eventually all dairies deal with manure solids in the pond. The summer irrigation season is a good time to circulate fresh ditch or well water through the storage pond to stir up and flush out as much of the accumulated solids as possible. Tractor mounted PTO driven choppers or floating agitator pumps can help disburse fibrous islands of solids. Professional excavating or dredging services may be necessary in ponds heavily loaded with solids.

If your ponds have weeds that need to be removed and you can't get it done, hire someone. Mosquito abatement districts have the authority to issue substantial fines. Fines have not been issued to dairies in

the past, but public health concerns about WNV make it a very real possibility. Please, no more front-page dairy headlines! Do your part to help "fight the bite" and reduce the risk from WNV.

Life Cycle of the House Mosquito

There are many species of mosquitoes in California, and all pass through four stages to their life cycle- the egg, larva, pupa and winged adult. Because water is essential for egg laying and hatching, and for development of larvae and pupae, the first three stages are spent in standing water. In about a week, the adult (male and female) mosquito emerges from the pupae and leaves the breeding place to mate and feed, and in the case of the female, to return to the breeding place to lay eggs. Before egg laying, she normally takes a blood meal from any available warm-blooded animal – birds, cattle, horses or people.

In manure storage ponds, only one mosquito species is normally found. It's scientific name is *Culex quinquefasciatus*; commonly called the "house mosquito". Another common name is "foul water mosquito" because of it's preference for unclean water as a breeding place.

Normally, eggs are laid in manure storage ponds in selected sites overgrown with weeds or in areas matted with floating material. The female may live 2 to 3 weeks and can lay as many as 40 to 100 eggs in a single batch every 3 to 4 days. The life cycle from egg to adult can be completed in 5 to 7 days. With such a rapid reproduction rate, adult mosquito populations can build up quickly to enormous numbers. The female mosquito can fly long distances from the breeding place in search of a blood meal and may cause a severe nuisance as well as a public health concern to communities four or five miles away from heavy mosquito producing manure storage ponds.

Reference: Planning Dairy Wastewater Systems for Mosquito Control, 1984. UC Division of Ag & Natural Resources Leaflet 21398.

Resources

Local mosquito abatement districts:

- Merced County Mosquito Abatement District, (209) 722-1527
  3478 Beachwood Dr., Merced, CA 95348
- Mosquito Abatement East Side District, (209) 522-4098
  2000 Santa Fe Ave., Modesto, CA 95357
- Turlock Mosquito Abatement District, (209) 634-1234
  4412 N. Washington Rd., Turlock, CA 95380
- Mosquito and Vector Control Assoc. of California, (916) 440-0826
  660 J St. Suite 480, Sacramento, CA 95814
- Mosquito and Vector Control District, (209) 339-9739
  7759 S. Airport Way, Stockton, CA 95206