

# Methane Reduction Strategies on California Dairies

## Lafranchi Dairy, Marin County

### Description of Operation:

The Lafranchi Dairy is a family dairy in the Nicasio Valley, Marin County. The Lafranchi's have been ranching on the land since the early 1900's. They own 1,500 acres, 900 of which are certified organic, including the dairy and loafing barns. During wet season 400+ cows are kept in the loafing barn up to 24 hours a day. In spring and summer they are let out to pasture and spend 4-5 hours a day in the milking barn. The dairy houses West Marin Compost (WMC) a public-private operation that leases land from the dairy. WMC was established in 2011 to produce a high-quality compost, help manage the nutrient load from the dairy, and to serve West Marin County's need to manage equestrian and green waste streams. Compost produced is used by the dairy for pasture and range application, as bedding for the cows and sold to the regional community for landscaping and agricultural purposes. WMC recently provided all the compost used for USDA-NRCS field trials to evaluate the impact of compost application on grazed grasslands across California.

### Manure Management Approach:

Between 12,000 and 13,500 gallons of manure is produced each day and managed by a water flush system. Combined water used for flushing the barns with manure-heavy effluent is sent to one of two static picket dam separators, where the water drains by gravity to the dairy lagoon. The remaining manure solids are moved from the separator to an 80x80 cement pad where they are mixed with green waste and equestrian manure. This mixture is then moved to windrows on the compost pad. Water from the lagoon is used for initial moistening of the windrows as needed, reducing water volume in the pond and allowing the nutrients in the water to be incorporated into the compost and stabilized through the thermophilic composting process.

### Proposed Manure Management Strategy

Once manure has been combined with water in the flush system, it is difficult to fully separate the solids, and the water produced after separation is nutrient-rich. The Lafranchi dairy and West Marin Compost would like to switch to a dry scrape system. This would require infrastructure changes in the loafing and milking barns, and a new pump to send the manure to the picket separators. This would significantly reduce the volume of water and solids in the lagoon and hence the quantity of methane produced. Changing the system to a dry scrape operation would have multiple benefits including:

- Reduction of methane derived from storing anaerobic liquid manure in an open pond
- Overall reduction of volume of water in the pond by an estimated 70-80%
- Nutrient management benefits
- Facilitation of compost production

### Co-Benefits:

The current lagoon is permitted under the existing Dairy General Order. However, it does not currently comply with the permeability requirements in the Water Board General Order for Composting Operations. Switching to a dry scrape system and using the existing static picket separator and cement pad would further reduce overall water in the pond and decrease the nutrient load in the water.

### Cost Estimate for System = \$1,250 - \$1,875 per cow

Switching to a dry scrape system, integrated with the compost operation, is estimated to cost \$500,000 - \$750,000.

