Ensiled Forages are a Key Ingredient in California Dairy Rations and Subject of Environmental Regulation

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INTRODUCTION

California is the number one dairy state in the nation, and California dairy rations rely heavily on the high quality forage produced in the state. Ideal growing conditions combined with ample fertilizer (recycled manure) and irrigation infrastructure allow forages to be a major component of California dairy cattle rations. California farmers have adopted best management practices to ensure silage quality is appropriate for the high producing cows they feed, as well as to decrease the need to purchase feedstuffs. Until recently, regulatory considerations were not a factor in the way dairy producers grew, harvested, stored and fed silage.

Today, California dairy producers comply with some of the strictest air and water quality regulations in the nation. These regulations impact decisions made on the dairy, from how much fertilizer to apply to crops to the feeding management of animals. Any discussion on silage management in California must now include both air and water regulatory components. We describe two silage management projects with both production efficiency and environmental implications, as well as a project in process that will further define silage management practices in California and identify best management practices to reach production goals and minimize silage losses.

PROJECT ONE: Variability in DM Content of Corn for Silage

Objectives

To determine if differences exist in calculating DM removal based on various intensities of sub-sample and composite collection for the purpose of quantifying forage removed from fields where manure is applied and nitrogen must be quantified.

Methods

Weights were obtained and samples collected for each truckload of forage harvested on a single corn field at three dairies; DM was determined. Actual field DM removal was determined by summing forage weight*DM for all samples from the field. Field DM removal totals were calculated using two composite sampling methods; **sequential** samples were those samples taken within an hour of harvest and **interval** samples were taken once per hour throughout the field's harvest.

Selected Results

Differences between estimated field DM removal and actual field DM removal based on method of sampling on one cooperator dairy.

	INDIVIDUAL	SEQUENTIAL	INTERVAL
% Difference	-21.5 to + 20.4	-5.14% to + 5.15	-2.71% to + 2.40
DM Difference (lbs)	± 135,000	± 33,000	± 16,500

Summary

Through more intense sampling, under- and overestimations were reduced. Interval samples across all dairies were ± 3% of actual DM harvested. Results have implications for buying/selling forages, feed inventory, as well as regulatory compliance.

PROJECT TWO: Survey of California Silage Management Practices

Objectives

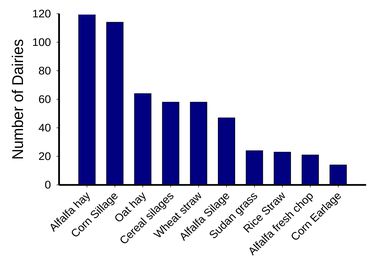
To describe current silage management practices in California's Central Valley dairies, and identify areas where silage management may be improved to increase feed quality and reduce feed losses

Methods

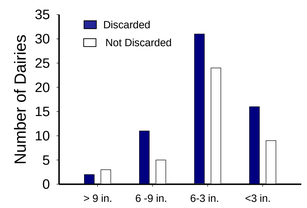
In summer 2009, a feed management survey was mailed to dairy producers in Tulare, Stanislaus, and San Joaquin counties; the first, third and seventh largest dairy counties in California, respectively. Producers received an envelope containing an invitation letter to participate in the study, a one-page survey, and a pre-paid return envelope. Response rate was 16.9% (120/710). Herd size ranged from 160 to 6,600 cows (median=950).

Selected Results

What forages do you feed?



How much spoiled forage is present on the top of the pile? Is it discarded?



Width and depth of face removed (% of dairies).

Width of Face Removed	Depth Removed (inches)				
	< 6	6 – 12	12 – 18	> 18	
Whole	9.6	12.0	7.2	7.2	**36.1**
Half	2.4	9.6	6.0	8.4	**26.5**
Third	4.8	10.8	10.8	3.6	**30.1**
Fourth	2.4	0.0	2.4	2.4	**7.2**
	19.3	**32.5**	**26.5**	**21.7**	

Summary

Silages are an integral component of California dairy rations. Alfalfa hay and corn silage are the two most common forages fed to dairy cows on California dairies. Cereal hay and silage are also frequently fed.

Although dairy owner and manager responses are subjective, results indicate areas where silage management can be improved, such as removal rate, surface spoilage, and sizing of silage structures. Survey results were used to educate regulatory agencies on the importance of silage in dairy rations, as well as silage best management practices.

PROJECT THREE: Description of Current Silage Management Practices and Identification of Obstacles that Prevent the Implementation of BMP *(2012 ANR Competitive Grant - in progress)*

Objectives

The overall goal of this project is to improve silage quality through best management practices, while mitigating the environmental impacts associated with utilizing silage as a feedstuff. The specific objectives are:

Objective 1: To describe current silage management practices: at harvest, ensiling, storage and feed out.

Objective 2: To identify the obstacles that prevent the implementation of best management practices (BMP).

Objective 3: To determine the costs of implementing various silage management practices.

Objective 4: To coordinate the development of silage teams involving nutritionists, agronomists, custom harvesters, UCCE Farm Advisors and Specialists, and dairy producers to implement BMP.

Objective 5: Determine the adoption rate of new/suggested practices in the subsequent year's silage harvest.