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California Rice Hay – An Opportunity Feed for California Dairies?

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Controlling feed costs is a key to profitability on dairies in California. As the size of the California dairy herd has increased in recent years, from about 1 million lactating cows in 1996 to over 1.8 million today, forage supplies have become much tighter. As tight hay supplies tend to lead to more price fluctuation, primarily due to weather related interruptions in supplies, California dairies have had to reach out further for hay. However increased trucking costs, mostly due to increased costs of fuel, has made importation of hay from Nevada, Arizona and Utah prohibitively expensive for many California dairy producers.

Efforts by nutritionists and producers to reduce the use of hay on dairies has resulted in lower feeding levels to lactating cows, and much lower feeding levels to replacement heifers. However to maintain desired growth rates, and stimulate rumen development, dairy heifers require relatively high levels of fiber in their diets to provide bulk, as well as slow rate of rumen passage, when combined with low fiber byproduct feeds.

Rice Hay – a Potential Fiber Source for Dairy Heifers

California is the second largest rice producing state in the US, and the area north of Sacramento is one of the most concentrated rice growing regions in the country. Rice hay is a co-product of the rice harvest. While most rice hay is incorporated into the soil to improve soil quality and provide nitrogen for the next year's crop, about 5% of rice acreage is baled for various uses, including cattle feed, for erosion control and for straw bale construction.

The rice harvest runs from late August to November, but rice hays produced through early September are put up more quickly than those in October when days are shorter, humidity is higher, and when rain can disrupt hay making. Rice growers have several methods of baling rice hay, but to qualify as feed quality hay, and not as the low forage quality materials used for erosion control, hay must be baled within ten days of harvest to prevent degradation of fiber quality due to bleaching and excessive field drying.

Differences Among Rice Hays – Harvest Options

Rice hay is produced by a variety of methods that include:

1) Baling the windrows from a harvester that simply drops the hay out the back of the harvester in much the same form that it entered the harvester.

2) Baling windrows with a baler that has a slicer apparatus that cuts the hay into 4 to 6 inch lengths.

3) Baling the windrows from a rotary style harvester which, depending on the make of harvester and ground speed during harvest, can shred the hay to variable extents.

4) Flail chopping the windrows to reduce particle size, and open the fiber structure, followed by baling.

Rice hay baling and stacking costs range from $25 to $40 per ton, while baling with a slicer and flail chopping before baling will add an additional $5 to $9 per ton. However differences among these preparation procedures are important in that they impact both the energy (e.g., TDN) value of the resulting hay (generally more processing increases the TDN) and changes the extent of processing required on the dairy prior to feeding.

A historical problem with rice hay (mostly from method 1) on dairies is that it required chopping prior to feeding which, due to the silica content of most rice hays, is a slow and energy intensive process that creates a lot of dust and quickly dulls chopper knifes. Dairymen have found that using a chopped rice hay (method 2) is best because it can be added directly to a TMR. However, based on limited field experience, methods 2, 3 and 4 rice hay have all been successfully used directly in a TMR.

The authors will be completing a field demonstration of hays from methods 3 and 4 on two commercial dairies in the fall of 2006 to further refine the required harvesting and baling procedures for rice hay to assure that direct addition to heifer TMR's is possible.

Differences Among Rice Hays – Nutrients

The nutrient value of rice hay is much less than alfalfa hay, generally making it inappropriate for lactation rations, but there is substantial variability in the nutrient levels and feeding value among rice hays. However, in general, California rice hays will average about 67% (+/- 5) neutral detergent fiber, 50% (+/- 3) acid detergent fiber (ADF) and 5% (+/- 1) crude protein (CP) - all values expressed on a dry basis (multiply values by 0.9 to convert to an 'as fed' basis).

Factors that impact rice hay feeding value include plant maturity at harvest (e.g., grain head moisture), the soils that the rice is grown in, the rice variety and the nitrogen fertilizer management. However extensive UC Davis research has indicated that rice hays with ADF values below 48% (dry basis) can be considered to be feed quality relative to replacement heifers, while those with ADF values above 50% (dry basis) should be avoided as feed for any class of cattle.

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