How is cheese from pastured cows unique?

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What makes specialty cheese special? More specifically, what taste characteristics make cheese from pastured cows unique? These are important questions for farmers and milk processors wanting to create specialty dairy products from the milk of pastured cows. Preliminary research from UW-Madison shows that cheese from the milk of pastured cows tastes significantly different from other cheese. This study was not able to identify the chemical compounds causing the flavor differences. A consumer panel preferred the cheese made from the milk of cows fed pasture and grain, similar to the milk produced on most Wisconsin grazing dairy farms.

Scott Rankin, UW-Madison Food Science Department, and Dave Combs, UW-Madison Dairy Science Department, cooperated on a three-year study to determine differences in taste and components between milk produced by cows on three different feeding regimens: pasture only, pasture and grain, and a grain-based Total Mixed Ration (TMR, a ration that combines forage, grain, minerals, vitamins and protein supplements in one mixture) with alfalfa silage as the forage source. Their work was supported by the USDA-CSREES, the Wisconsin Milk Marketing Board and CIAS.

Setting up the trial

Fifteen first lactation Holstein cows were rotated through each of the three feeding systems using a new group of cows each year. The TMR and Pasture+Grain treatments were formulated to contain adequate energy, protein, vitamins, and minerals to support 65 lbs. of 4% fat corrected milk daily according to National Research Council guidelines.

The Pasture Only and Pasture +Grain groups were fed in a managed grazing system at the UW Arlington Agricultural Research Station. Pastures were mixtures of kura clover and low endophyte tall fescue. Portable front and back fences were used to control the cows. Fresh pasture was offered twice daily on the paddocks by moving the front fence, and the back fence was moved three times a week to limit grazing of regrowth. The paddocks were divided into three sections that were mechanically clipped to stimulate regrowth; cows grazed on forage between 14 and 21 days of regrowth. The 2004 grazing season ran from May 5 through July 15; the first 2005 pasture period was from May 25 through July 7 and the second was between August 25 and September 12.

Raw milk composition

In both 2004 and 2005, total milk production for the Pasture+Grain and TMR groups was similar (see Table 1 below). Production was lower for the Pasture Only group. Dave Combs explains, "This was likely due to an energy imbalance caused by a lower total intake of energy when cattle have no access to supplemental grain." In 2004, milkfat composition was similar for cows fed pasture only and TMR, while the Pasture+Grain group had lower milkfat. Combs suggests that when grain is offered, pasture intake and therefore fiber intake may limit optimal milkfat synthesis.

Table 1. Milk yield and composition from three feeding groups

	Year	Pasture Only	Pasture +Grain	TMR
Milk yield, lb.	2004	38*	63	58
	2005	48*	66	64
Milk composition				
True protein, %	2004	3.0*	3.12	3.09
	2005	2.66*	2.74	2.84
Fat, %	2004	3.8	3.4*	3.9
	2005	3.41	3.36	3.84*
SCC, x 1000**	2004	244	74	109
	2005	47	52	57

*these values were significantly different, statistically, from the other values in the row

**SCC for all treatments indicates high-quality milk. The differences in SCC have minor biological significance.