

- Performance of Cows Fed Diets Differing In Proportion of Forage Provided By Alfalfa And Corn Silage.

Corn silage and alfalfa hay or silage are the two most important forages in North American dairy diets. They are complimentary feedstuffs in that alfalfa is high in protein and corn silage is low. They are complimentary crops in that the nitrogen-fixing legume is an ideal crop in rotation with corn. Corn silage can yield more biomass per acre and typically at lower cost per ton of dry matter than alfalfa. On the other hand, producing corn silage presents greater environmental risk, even more than growing corn for grain, because virtually no crop residue remains following harvest. Identifying the optimum blend of these two forages for a given dairy operation (where both forages can be produced) is a systems question, taking into account soil quality, nutrient management, labor supply, feed storage, cow response, etc.

Studies in the 1980's with cows that today we may consider as low or moderate in milk production level (25-30 kg/day) showed little difference in milk production as the proportion of alfalfa or corn silage in the diet was varied. Broderick (1985) found comparable milk production among cows fed diets based on either high quality alfalfa silage or corn silage balanced with corn grain, soybean meal and other supplements. Colenbrander et al (1986) formulated diets that were based on equivalent concentrations of NDF using three combinations of alfalfa and corn silage and found no differences in actual milk production or milk composition.

A complete lactation study with higher producing cows was conducted more recently (Dhiman and Satter, 1997). The experiment started at calving, and lasted until cows completed 44 weeks of lactation. Forty-five mature and 29 first lactation cows were randomly assigned before calving to one of three forage treatments according to calving date. The three treatments were: AS (alfalfa silage supplied all of the forage), 2/3 AS (alfalfa silage supplied 2/3 of the forage), and 1/3 AS (alfalfa silage supplied 1/3 of the forage). Corn silage provided the remainder of forage. The cows were fed diets containing 50% forage and 50% concentrate.

Table 1 contains results for the entire lactation. Dry matter intakes were similar, but slightly higher for the 2/3 alfalfa treatment. Milk yields followed a similar trend, being slightly higher for the 2/3 alfalfa treatment. The mixed forage diets appeared to have an advantage in terms of milk fat and milk protein. No differences were noted in body weight change during lactation due to treatment.

\

Table 1. Nutrient intake and lactation performance of primiparous and multiparous cows fed diets containing different proportions of alfalfa silage (AS) and corn silage (CS).¹

	Diets²			
Measurement	AS	2/3 AS	1/3 AS	SEM
Cows, no.	25	25	24	
Dry matter intake, kg/d	20.9	21.4	21.1	0.3
Milk yield, kg/d	31.1	32.4	31.4	0.5
3.5% FCM, kg/d	31.0	32.9	31.8	0.5
Feed efficiency, kg				
FCM/kg of DMI	1.50	1.58	1.54	0.04
Milk fat, %	3.35	3.67	3.65	0.05
Milk protein, %	3.08	3.15	3.19	0.03
305-d Milk yield, ³ kg				
Primiparous cows	8124	8412	8168	284
Multiparous cows	9593	10,170	10,024	317

¹Data summarized from wk 1 through 36 of lactation.