

Pea Silage in Dairy Diets

In the 1970s and 80s, field peas were often grown in Western Canada as a forage crop. The peas were commonly seeded with barley in an attempt to increase the protein content of the whole crop when harvested as silage. Since peas do not compete well with barley, the results were often disappointing (see table below) and the practice has since declined dramatically.

With a nutrient composition similar to alfalfa, (table below) whole plant peas have great potential as high quality forage for dairy cattle. Like alfalfa, whole plant peas are higher in protein and calcium than grasses and cereals. Barley, alfalfa and pea forages grown under similar conditions contain comparable levels of acid detergent fibre (ADF). However, neutral detergent fibre (NDF) levels are lower in the two legumes than in barley.

	Barley	Alfalfa	Pea	Pea & Other [†]
Dry Matter	36.3	40.0	32.2	37.5
Crude Protein	11.0	16.7	15.6	12.1
ADF	32.0	36.0	34.0	34.9
Calcium	0.49	1.64	1.24	0.64
Phosphorus	0.26	0.23	0.26	0.27

[†]silage in which peas were the main constituent, barley is most often the second component.

Feed Intake

Low cell wall (NDF) content of forages is associated with high dry matter (DM) intake in dairy cattle and is a major factor in defining forage quality. Alfalfa is a favoured forage for cattle because of its high DM intake potential. Work at the University of Alberta has shown that steers will consistently consume more DM from alfalfa (average 2.5% of body weight) than barley silage (average 1.9%). Other research with dairy heifers has demonstrated similar results when pea silage (2.6%) was compared with oat silage (2%). In one experiment where pea silage was compared to alfalfa and barley silages, steers ate more alfalfa than barley silage as expected; consumption of pea silage was intermediate (see table top right).

	Barley	Alfalfa	Pea
DM Intake, %BW	2.7-3.0	1.7-2.2	2.0-2.3
Digestibility, %			
Dry Matter	72.4b	68.3c	76.6a
Energy	72.3b	70.8b	77.0a
Crude Protein	71.7	73.2	72.0
ADF	70.3a	60.9b	71.2a
NDF	72.6ab	64.1b	77.2a

a,b,c within rows, values with different superscripts are significantly different from one another

Digestibility

Dry matter digestibility (DMD) of pea silage appears to be similar to alfalfa silage and superior to barley silage. Fibre (ADF and NDF) digestibility followed the same trend as DMD. Digestibility of energy was significantly higher for the pea silage than for alfalfa or barley silage. The digestibility of the crude protein did not differ among these forages. This high digestibility coupled with the moderate to high DM intake potential suggests that whole plant pea silage can replace alfalfa in diets for high producing dairy cows.

Milk Production and Composition

There is only one study where pea silage has been compared with alfalfa silage in diets for lactating cows. Partial total mixed rations (TMRs) balanced for high production included 28.8% pea silage or 33.8% alfalfa silage (DM basis), with barley silage as the remainder of the forage. Concentrate not included in the partial TMR was fed in proportion to milk production. Over the 4 months of the experiment, milk yields from the two groups did not differ significantly (see table below). Milk composition was also not affected, demonstrating that pea silage can be an effective substitute for alfalfa silage in diets for lactating cows.

	Alfalfa	Pea
Milk Yield, kg/day	31.4	32.6
Milk Fat, %	3.58	3.48
Milk Protein, %	3.12	3.21

sources: R.R. Corbett et al., Proc West Sec ASAS 46:530 (1995)
G.W. Mathison et al., Proc West Sec ASAS 46:323 (1995)