

The effect of feeding hay before fresh alfalfa on the occurrence of frothy bloat in cattle

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Majak, W., Garland, G. J. and Lysyk, T. J. 2008. **The effect of feeding hay before fresh alfalfa on the occurrence of frothy bloat in cattle.** *Can. J. Anim. Sci.* **88**: 29–31. Alfalfa or orchardgrass hay was fed to cattle before feeding fresh alfalfa herbage at the vegetative to early bud stage of growth to observe the subsequent impact on bloat. Alfalfa hay supplements reduced the incidence of bloat by a third in one trial, but no effect was seen in a second trial. In contrast, supplements of orchardgrass hay reduced the occurrence of bloat by >90% in 2 yr of trials. Supplemental orchardgrass hay can be effective in the control of pasture bloat.

Key words: Steers, frothy bloat, *Medicago sativa* L., *Dactylis glomerata* L., hay supplements.

Majak, W., Garland, G. J. et Lysyk, T. J. 2008. **Absorption de foin avant la luzerne fraîche et incidence sur l'indigestion spumeuse aiguë chez les bovins.** *Can. J. Anim. Sci.* **88**: 29–31. Les auteurs ont donné du foin de luzerne ou de dactyle pelotonné à des bovins avant de leur servir de la luzerne fraîche récoltée au début du bourgeonnement afin de vérifier l'impact d'une telle mesure sur le météorisme. Le foin de luzerne a coupé l'incidence du météorisme du tiers dans un premier essai, mais aucune incidence n'a été observée lors du second. En comparaison, le foin de dactyle a réduit l'incidence du météorisme de plus de 90 % les deux années de l'expérience. Un supplément de foin de dactyle pelotonné constituerait un bon moyen de lutte contre l'indigestion spumeuse aiguë au pâturage.

Mots clés: Bouvillons, indigestion spumeuse aiguë, *Medicago sativa* L., *Dactylis glomerata* L., suppléments de foin

Orchardgrass (*Dactylis glomerata* L.) and alfalfa (*Medicago sativa* L.) hay have long been known as feeds unlikely to cause bloat. However, alfalfa hay of high quality has caused bloat on occasion (Howarth 1975). In our continuing studies on bloat over the past decade, alfalfa hay or orchardgrass hay have been used as a ration during the interval between bloat trials, and then bloat usually occurs within a few days of exposure to fresh alfalfa. As well, it has been shown that orchardgrass herbage, as a 25% component of a fresh alfalfa herbage diet, can also reduce the incidence of bloat in cattle (Majak et al. 2003). The objective of the present study was to determine the impact of hay supplements on the subsequent occurrence of bloat. Cattle were given hay supplements first and then freshly harvested alfalfa herbage.

In the earlier studies, animals were fed fresh alfalfa herbage at 10 kg DM head⁻¹ d⁻¹ and each hay was fed before the alfalfa herbage trial. Accordingly, the effect of daily hay rations (2.5 kg DM head⁻¹ d⁻¹) given before the onset of feeding fresh alfalfa at the vegetative to early bud stage of growth was investigated to determine the impact of supplemental hay on the

subsequent occurrence of bloat. Early stages of alfalfa growth are most likely to cause bloat (Thompson et al. 2000).

Studies with ruminally fistulated Jersey steers were conducted at Kamloops, BC, during the summers of 2005 and 2006. Four separate trials were conducted, two using alfalfa hay as a supplement, and two using orchardgrass as a supplement. The alfalfa trials and first orchardgrass trial were conducted in 2005 and the final orchardgrass trial was conducted in 2006. Each trial was conducted as a two-period crossover design using two groups of four animals except for the first orchardgrass trial in 2005 when three animals were used per group. In each trial, animals in the control group were fed 100% freshly harvested alfalfa (cv. AC Longview) grown under irrigation (Majak et al. 2001) while animals in the supplement group were given hay rations before the fresh alfalfa herbage. It should be noted that unlike continuous grazing, feeding in confinement is a much more vigorous test of a treatment owing to the higher incidence of bloat (Majak et al. 2001). The length of each period of the crossover trial continued until the sum of the cases of

Table 1. Effect of feeding hay before fresh alfalfa on the incidence of bloat in cattle

Year	Hay Supplement	Frequency of bloat ^z			Frequency of multiple distensions ^y		
		Control	Supplement	Chi ²	Control	Supplement	P (Fisher's)
2005	Alfalfa	33	18	8.5**	8	0	0.04
2005	Alfalfa	24	24	0.01NS	19	19	1.0
2005	Orchardgrass	44	4	58.0***	35	1	0.04
2006	Orchardgrass	45	4	53.0***	32	0	<0.001

^zChi² is from Cochran's Q test and has df=1. **, *** Significant at $P < 0.01$ and $P < 0.0001$, respectively; NS, not significant.

^yP (Fisher's) is the probability of differences between control and supplemented groups using Fisher's exact test.

bloat reached a minimum of 24 (Majak et al. 1995). Between periods, cattle were fed alfalfa hay for at least 1 d. Animals were cared for under the guidelines of the Canadian Council on Animal Care.

Ruminal cannulae of all steers were opened at least once daily beginning approximately 0.75 to 2.0 h after feeding began, to assess the severity of bloat as described by Majak et al. (1995). The average feeding time was approximately 6 h head⁻¹ d⁻¹. A single animal bloating on one day was counted as one animal-day of bloat, but the animal may have distended more than once on that day. The animal data for each trial in each year were analyzed separately to compare the frequency of bloat between the supplemented and control groups. Comparisons for the effects of hay supplements were made using Cochran's Q-test adapted for crossover designs (Cochran 1950).

Alfalfa hay was used as a supplement in 2005. Although significant reductions in frequency of bloat and multiple distensions were observed in the first trial (Table 1), >30% of the bloat cases occurred in the supplemented group. In the second trial, 50% of the bloat cases were seen with the alfalfa hay supplement. The number of samples used to determine protein and fibre content of the alfalfa hay were limited to 1–2 core samples for each trial. Nonetheless, the crude protein and fibre composition of the hay supplements did not readily explain the differences between the two alfalfa supplement trials nor

did the fresh alfalfa analyses (Table 2). It should be noted that the incidence of bloat in the second trial was unaffected by the alfalfa hay ration that reduced the intake of fresh alfalfa from 10 to 7.5 kg DM head⁻¹ d⁻¹, which has been more than sufficient to cause bloat (Hall et al. 1988).

In contrast, supplements of orchardgrass hay had a substantial impact on the subsequent occurrence of alfalfa bloat (Table 1). In the first trial in 2005, orchardgrass supplementation reduced the frequency of bloat by >90% and the results in 2006 were equally impressive (Table 1). As well, multiple distensions of the rumen, which reflect the bloat potency of the alfalfa, occurred only once in 2 yr of testing with orchardgrass hay supplements. In these cases, the animals ate part of their ration and bloated. After recovery, they return to feeding and bloat again. In short, feeding orchardgrass hay before intake of fresh alfalfa provided yet another management tool and has reduced the onset of frothy bloat by >90%. Contributing factors in orchardgrass could be the lower CP and the higher fibre content of the forage (Majak et al. 2003). Experiments are in progress on the efficacy of orchardgrass supplements for the prevention of bloat in cattle grazing pure stands of alfalfa. It should also be noted that corn silage supplementation before grazing alfalfa has also been used for the reduction of bloat and the incidence of bloat was reduced by about 50% (Bretschneider et al. 2001).

Table 2. Protein and fibre content of hay and forage in each crossover trial

Year	Hay supplement	Hay				Forage			
		n	% protein	% NDF	% ADF	n	% protein	% NDF	% ADF
2005	Alfalfa	2	19	46	62	10	26 ± 1	32 ± 3	55 ± 2
2005	Alfalfa	1	17	44	65	8	25 ± 3	33 ± 3	56 ± 2
2005	Orchardgrass	1	15	50	65	10	23 ± 2	32 ± 3	54 ± 2
2006	Orchardgrass	2	16	47	66	17	26 ± 2	34 ± 3	55 ± 2

Mean ± SD are presented for the forage data only. SD were not calculated for the hay due to the low number of core samples taken.

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