

# The use of by-products from the potato processing industry in beef finishing diets

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Over 2 million tonnes of potato processing waste (PPW) is produced annually in Canada. Depending on the type of processing, PPW (\$10–25/t DM) is low and variable in dry matter (DM) content (100 to 300 g/kg), low in crude protein (CP; <100 g/kg DM), high in starch (>500 g/kg DM) and can have widely varying fat concentration (5 to 100 g/kg DM).

Ninety steers with initial liveweight (LW) 420 kg were allotted to 5 diets, fed for 79, 107 or 135 d, comprising 20% grass silage and 80% concentrate which was rolled barley decreasing from 100% to zero with the inclusion of 0, 25, 50, 75 and 100% PPW. Steers fed 50% PPW in the concentrate had the highest gains ( $P<0.05$ ) but LW and carcass weight at slaughter were similar for all treatments (Table 1). DM intake declined as % PPW increased, thus influencing feed to gain ratio ( $P<0.05$ ). There were no effects of diet on any carcass or meat quality attributes. As time on feed increased, LW gain declined ( $P<0.05$ ), carcass

attributes were unaffected, and meat flavour and texture improved ( $P<0.05$ ).

In a 3 x 3 Latin square digestibility trial steers were fed *ad libitum* diets containing 0, 40 or 80% of a concentrate that was a 50/50 mixture of PPW and barley (DM basis); thus the 80% concentrate diet was the same as the 50% PPW diet in the production trial. A quadratic response in dry matter digestibility (DMD) to concentrate inclusion suggested a depressing effect of concentrate on silage DMD. However, the 80% concentrate diet had a high digestibility (77%), and *ad libitum* DM intake increased linearly as the concentrate proportion increased.

The production trial showed that high proportions of PPW can be fed to finishing cattle without detrimental effects on performance, carcass or meat characteristics. Moderate inclusion of PPW may depress forage digestibility, but this is not of concern in high-PPW diets.

**Table 1** Effect of PPW and days on feed on performance, carcass meat quality of steers and diet digestibility.

	% PPW in concentrate					SEM	Days on feed			SEM
	0	25	50	75	100		79	107	135	
Final LW, kg	581	583	595	582	573	8.19	587	584	580	6.63
LW gain, kg/d	1.68a	1.70a	1.93b	1.61a	1.69a	0.06	1.72c	1.54b	1.43a	0.05
DM intake, g/kg LW	21.5c	21.9c	20.1bc	18.7ab	17.1a	0.73	–	–	–	–
Feed:gain	6.33b	6.43b	5.16a	5.61a	5.34a	0.18	–	–	–	–
Carcass weight, kg	325	326	329	322	317	5.35	324	325	325	4.36
Backfat, mm	7.25	6.90	7.19	7.25	6.42	0.54	6.53	7.18	7.45	0.43
Raw meat moisture, %	73.4	72.9	72.9	73.1	73.2	0.16	73.4c	72.7a	73.1b	0.07
		0% concentrate		40% concentrate		80% concentrate		SEM	Response ( $P<0.001$ )	
DM intake, g/kg LW		16.7		19.6		21.8		0.46	Linear	
DM digestibility, %		67.2		64.1		77.4		1.15	Quadratic	
Digestible DM intake, g/kg LW		11.2		12.6		16.9		0.42	Quadratic	

Means in a row with different superscripts differ ( $P<0.05$ )