Evaluation of Pea Forages in Growing and Finishing Feedlot Rations

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Most of the research feeding peas has focused on pea grain and we have discovered that this grain legume is an excellent feed for all classes of livestock including finishing beef cattle (Lardy et al., 2009; Anderson et al., 2007a; 2007b; and 2007). Field pea is an excellent forage crop as well, and can be harvested as hay or silage and fed alone or mixed with cereal grain. If peas are planted very early and harvested for forage, there may be opportunity for double cropping if peas are followed by a shorter season crop, or winter wheat can follow pea forage. Peas are often planted with a cereal grain to improve yields and harvestablilty. Forage barley or oats work well with field peas in hay or silage scenarios. In this study, finishing steers were fed different pea forages in the finishing rations to evaluate animal performance and effects on carcass traits.

Steers (n=156) consigned by 40 different producers in the Dakota Feeder Calf Club arrived at the Carrington Research Extension Center on October 16, 2010. Steers were fed a common diet (55 Mcal/lb) for approximately one month prior to randomly allotting to one of 16 pens with four treatments and four replicates per treatment.

Forage treatments in the corn-based growing rations (Table 1) and finishing rations (Table 2) were grass hay, field pea residue, field pea-barley hay, and field pea hay. All forages were chopped in a tub grinder with pea hay and barley hay mixed at grinding. Pea hay was harvested from grain-type peas when peas were as large as BB's in the pod. Haybet forage barley was cut at soft-dough stage and all forages handled as large round bales. Pea residue from fields that were not sprayed with a desiccant prior to harvest was rolled into large round bales after harvest. Forages were added to the totally-mixed rations fed to appetite daily. Rations for each treatment were mixed in a Knight "Little Augie" 3 auger mixer box and delivered to the respective pens once each day with feed deliveries recorded. Steers were weighed at the start of the trial and approximately every 28 days. Flooding conditions prohibited an intermediate weight during the final period resulting in a 54-day weigh period. Steers were transported to Tyson Meats, Inc. in Dakota City, NE for harvest on May 4, 2011. Carcass data was collected after a 24-hour chill by trained meat scientists in collaboration with USDA graders.

Table 1. Feedlot growing rations with pea forages (percent, dry matter basic).

	Grass Hay	Pea Residue	Pea/Barley Hay	Pea Hay
Grass Hay	30.65			
Pea Residue		28.79		
Pea/Barley Hay			30.80	
Pea Hay				30.01
Mod Wet Dist Gr	23.90	24.57	23.93	24.16
Barley	13.38	13.67	13.31	13.52
Corn	30.51	31.40	30.51	30.82
$CaCo_3$	0.54	0.54	0.50	0.51
Supplement	1.01	1.03	0.95	0.97

Table 2. Feedlot finishing rations with pea forages (percent, dry matter basis).

	Grass Hay	Pea Residue	Pea/Barley Hay	Pea Hay
Grass Hay	15.38			
Pea Residue		14.11		
Pea/Barley Hay			15.47	
Pea Hay				16.71
Mod Wet Dist Gr	19.91	20.16	19.92	20.40
Barley	15.94	16.18	15.95	16.13
Corn	46.83	47.61	46.68	44.79
$CaCo_3$	0.65	0.67	0.67	0.65
Supplement	1.30	1.30	1.31	1.31

Feedlot performance data and carcass information is reported in Table 3. Highly positive results were observed for the pea-barley hay and the pea hay during the growing phase of the study, with pea hay continuing to support improved animal performance during finishing. In economic terms, the same feed cost is observed when grass hay is valued at $60 per ton, pea-barley hay at $95 and pea hay at $138 per ton during the growing phase. During finishing, pea-barley hay is equal to grass hay but pea hay is valued at $116 per ton. Growing these forages for less than these respective prices will provide enhanced net returns.

Table 3. Feedlot performance and carcass traits of steers fed pea forages during growing and finishing.

		Treatments					
		Grass Hay	Pea Residue	Pea-Barley Hay	Pea Hay	St Err	Pvalue
Initial Wt, lb	16-Nov-10	717.2	726.7	726.9	725.4	36.0	0.62
Market Wt, lb	3-May-11	1327.3	1348.5	1358.2	1387.3	44.4	0.02
Dry matter intake, lb							
Growing		22.70	23.13	24.66	23.81	1.13	0.06
Finishing		23.48	23.02	23.10	21.20	0.83	0.12
Overall		23.39	23.31	23.68	23.42	0.83	0.95
Average Daily Gain, lb							
Growing		3.60	3.66	4.13	4.27	0.16	<0.0001
Finnishing		3.65	3.72	3.57	3.77	0.12	0.02
Overall		3.63	3.69	3.75	3.93	0.07	0.01
Efficiency, Feed/gain							
Growing		6.39	6.62	6.11	5.66	0.29	0.13
Finishing		6.36	6.13	6.41	5.59	0.25	0.05
Overall		6.44	6.29	6.30	5.95	0.16	0.09
Carcass Traits							
Dressing Pecent		0.62	0.62	0.62	0.63	0.003	0.24
Marbling Score*		452	429	455	448	15.46	0.64
Hot Carc Wt, lb		783	795	804	828	26.1	0.00
Fat Thickness, in		0.45	0.42	0.46	0.48	0.03	0.44
Rib eye area, sq in		14.03	14.1	13.93	14.24	0.22	0.68
KPH, %		2.3	2.43	2.33	2.32	0.06	0.22
Yield Grade		2.56	2.56	2.73	2.77	0.176	0.42

* 400 = low choice

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This material is based upon work supported by the U.S. Department of Agriculture, under agreement No. 2010-34473-21533. Any opinions, findings, conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U. S. Department of Agriculture.