An active dry yeast (Levucell®SC) in barley-based feedlot diets.

Final Report.

Darryl Gibb and Fred Van Herk

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Summary

A trial was conducted at a commercial feedlot (Claresholm Beef Producers Ltd) to evaluate effects of including an active dry yeast (*Saccharomyces cerevisiae CNCM-1077*; (Levucell®SC; Lallamand Animal Nutrition)) in barley-based feedlot diets of feedlot cattle. Upon arrival, 1195 British cross heifers (393±8.0 kg) were randomly assigned to 1 of 12 pens that housed 96 to 100 animals per pen. Diets contained dry-rolled barley (from 48 to 83% of DM), barley silage, and a supplement mash included at 3% of diet DM (Table 1). Levucell®SC was included at 1.67 kg / tonne of supplement to provide an estimated 0.40 g yeast/hd/d, or 8 x 10^9 CFU/head/day. Millrun and barley hay was also fed when economically viable. Backgrounding diets contained 22 mg / kg monensin sodium, and were fed for the first 38 d (Table 2). Monensin was included in finishing diets at 22 and 33 mg / kg of DM for treatment and control diets respectively. Tylosin phosphate was included in both treatment and control finishing diets at 11 mg/kg. Whole pens of cattle were sold when deemed to be "finished" (about 580 kg) by the feedlot manager. Cattle were slaughtered between d 158 and d 208 on feed. Gains were calculated based on sale weights into and out of the feedlot. Average dry matter intakes were calculated based on the amount of feed delivered to each pen multiplied by the percent dry matter of each ration fed. Due to missing data, pen 109 (control diet) was removed from the analysis.

Performance results are presented in Table 4. During the first 38 d, dry matter intake (DMI) was not different (P = 0.47) between cattle receiving control (10.6 kg/d) and Levucell®SC (10.8 kg/d) diets. Through the whole feeding period, DMI was not different (P = 0.52) between treatments, but cattle fed Levucell®SC had slightly (P = 0.10) higher daily gains (1.12 vs 1.06 kg/d). Gain/feed was also slightly (P = 0.11) higher for cattle fed the treatment (0.111) than control (0.106) diets. Finish weights were similar (P = 0.31) for Levucell®SC (579.8 kg) and control (585.2 kg) cattle, but cattle fed Levucell®SC required fewer days (165 vs 181.6 d; P = 0.03) to reach this weight.

Based on these performance differences, and using $0.25 yardage with current feed costs, feeding Levucell®SC equates to a reduction of 3.0 cents per pound of gain with an increased gross profit (not considering cost of Levucell) of over $12 per animal. These calculations assumed the same in and out weight of cattle. However, caution should be used assuming these performance values as differences between treatments were not statistically strong (P values: ADG = 0.10, Gain/Feed = 0.11).

Additional details:

Mixed model was used for statistical analysis using the Tukey-Kramer adjusted difference in Least Square Means to compare treatment differences.

A total of 3 animals died during the trial from reasons not related to treatment (1 bloat, 1 BVD, and one not determined)

Data used in statistical analysis is outlined in Table 3.

Table 1. Diets fed during trial (DM basis)

	% DM	1310	1410[a]	1510	1610[b]	1610[b]	1710	1716
Barley	86.5	47.81	61.74	70.34	81.79	71.38	79.83	83.06
BG Sup.[1]	97	2.98	2.99					
Finish Sup.[2]	97			2.99	3.00	3.08	3.07	3.01
Silage	35	19.91	17.23	11.53	4.33	19.06	13.46	13.94
Barley hay	88		18.04	11.59				
Millrun	88	6.54		3.55	10.88	6.49	3.64	
Nutrient levels[3]								
% Dry matter		67.33	69.36	74.33	81.72	67.79	72.44	71.97
Protein, %		13.19	12.84	12.61	12.34	13.04	12.81	12.59
NDF, %[4]		31.97	29.4	25.46	22.78	24.17	22.27	22.36
Calcium, %		0.67	0.64	0.71	0.68	0.72	0.69	0.68
Sodium, %		0.13	0.13	0.16	0.16	0.16	0.16	0.16
Copper, mg/kg		17.41	17.23	19.99	19.89	21.25	21.03	20.44
Zinc, mg/kg		106.76	104.49	121.16	120.05	129.89	128.14	123.72
Manganese, mg/kg		64.19	57.61	67.60	62.79	75.67	71.42	66.62
Iodine, mg/kg		0.90	0.90	1.05	1.05	1.08	1.07	1.05
Cobalt, mg/kg		1.21	1.43	1.61	1.77	1.68	1.79	1.84
Selenium, mg/kg		0.34	0.35	0.40	0.40	0.42	0.42	0.42
Monensin, mg/kg		21.90	21.97	32.87	33.04	33.84	33.73	33.06
Tylosin, mg/kg				10.97	11.02	11.29	11.25	11.03

[a]Millrun was included in this diet for a total of 5 days. Formula not presented. [b]Barley hay and millrun used as dictated by silage inventories and commodity prices. Some formulas not presented. [1]Backgrounding supplement contained 3.67 kg Rumensin 200 targeting 22 mg/kg diet DM in both control and treatment supplements. Treatment supplements contained 1.67 kg Levucell / tonne of supplement targeting 0.4 g yeast / animal / day. [2]Finishing supplement Contained 5.5 and 3.67 kg Rumensin 200 per tonne of supplement to provide 33 and 22 mg/kg of monensin in diet DM for control and treatment diets respectively. [3]All Nutrient levels (other than % dry matter) expressed as a % of the dry matter. [4]Neutral Detergent Fibre.

Table 2. First date each diet was fed to each pen

diet	101	102	103	104	105	106	107	108	109	110	111	112
1210	30-Apr							30-Apr				
1310	2-May	30-Apr	30-Apr	30-Apr	30-Apr	30-Apr	30-Apr	2-May	30-Apr	30-Apr	30-Apr	30-Apr
1410	18-May	18-May	18-May	18-May	17-May	18-May	18-May	18-May	18-May	18-May	18-May	18-May
1510	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun	7-Jun
1610	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun	17-Jun
1710	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug	23-Aug
1716	7-Sep	7-Sep	7-Sep	7-Sep	7-Sep	7-Sep						
Last day	4-Oct	30-Oct	4-Oct	13-Oct	13-Oct	13-Oct	13-Oct	13-oct	10-Oct	10-Oct	13-Oct	13-Oct

Table 3. Input used in statistical analysis

Pen	#In	hddays[a]	Trt[b]	ttlinwt[c]	38dmi[d]	39dmi[e]	Deads	DOF[f]	ttloutwt[g]	#out	ttlhddays[h]
101	100	3800	Lev	78968	36443	114522	1	158	122265	99	15738
102	100	3800	Lev	90239	42333	121532	1	164	129606	99	16331
103	100	3800	Lev	88309	41896	132296	0	167	130503	100	16700
104	100	3800	Lev	86699	42410	132297	0	167.5	126578	100	16694
105	100	3800	Lev	91423	42099	134714	0	168	131281	100	16700
106	100	3798	Lev	87504	42312	126329	0	169.5	126389	100	16697
107	100	3771	Cnt	84264	40528	121327	2	171	122683	98	16846
108	100	3800	Cnt	80452	36355	124630	0	172	123701	100	17288
109	99	3785	Cnt	85641	34188	0[z]	0	187.8	130593	100	18775
110	100	3798	Cnt	86573	41259	134481	1	174	126098	99	17046
111	96	3648	Cnt	85758	40524	137532	0	174	126502	96	16258
112	100	3794	Cnt	90268	40093	163495	0	208	134711	100	20794

[a]head*days upto d 38. [b]Treatment: Lev = cattle received Levucell, Cnt = cattle did not receive Levucell. [c]Total net in weight, kg. [d]Dry matter delivered up to day 38. [e]Dry matter delivered from day 39 to finish. [f]Days on feed. [g]Total net out weight, kg. [h]Total head*days. [z]20 days of feed deliveries missing. Pen not considered in analysis. [d]Average days on feed

Table 4. Results of including Levucell in feedlot diets

	Control	Levucell	P=
Number of pens	5	6	
Total animals in	590	595	
Initial weight, kg	390.9±8.54	395.5±7.80	0.70
DMI, kg/d			
D 1-38	10.6±0.155	10.8±0.142	0.47
d 39-finish	9.9±0.211	10.0±0.192	0.74
d 1-finish	10.0±0.229	10.2±0.209	0.52
Final weight, kg	585.2±3.66	579.8±3.34	0.31
Total gain, kg	191.8±3.66	186.4±3.34	0.31
Days fed	181.6±4.403	165.0±4.016	0.03
ADG, kg/d	1.06±0.025	1.12±0.023	0.10
Gain/feed	0.106±0.002	0.111±0.002	0.11