Evaluation of rolled wheat and CCM as concentrate replacers for dairy cattle

S. De Campeneere*, D.L. De Brabander and J.M. Vanacker
ILVO, Animal Science Unit, Scheldeweg 68, 9090 Melle, Belgium

Introduction:

The use of home-grown wheat in dairy cattle nutrition has gained interest over the past few years for different reasons. Furthermore, there is an increased interest of farmers to reduce feeding costs by using home-grown feeds. In a previous study, De Campeneere et al. (2006) compared three treatment forms of wheat (rolled, NaOH-treated and immature ensiled). Results seemed positive, however, in that trial, no control diet without wheat was involved.

Trial aim: Evaluate rolled wheat and CCM as concentrate replacers for dairy cattle

Materials and methods:

- 3 diets, 3x6 lactating Holstein cows, Latin square design (3x4 weeks)
- at start of the trial: 117 DIM: 34.7 kg milk, 4.17% fat, 3.04% protein
- control diet: maize silage/ prewilted grass silage (55/45 on DM) fed ad libitum and completed with pressed beet pulp (3.1 kg DM), soybean meal and compound feed.
- treatments: part of the conc. was replaced (on protein and energy basis) by wheat (3.9, 3.4 and 2.9 kg DM for period 1, 2 and 3) or CCM (3.9, 3.5 and 3.1 kg DM for period 1, 2 and 3) and soybean meal.
- concentrate level was fixed (at start of trial) to supply 105% of the energy and digestible protein requirements, and decreased weekly to correct for the change in lactation stage

Results:

Wheat treatment		Rolled wheat	CCM	Control	MSE	P-value
Diet composition	CP	133	134	135	-	-
(g kg^{-1}DM)	NDF	335	319	364	-	-
	FOM	582	554	557	-	-
	Starch	252	260	172	-	-
Intake	Total DM	20.1^{a}	20.2^{ab}	21.2^{b}	1.1	0.008
(kg d^{-1})	wheat /CCM	3.4	3.6	-	-	-
	conc (incl minerals)	2.8	2.9	5.7	-	-
	pressed beet pulp	3.1	3.1	3.1	-	-
	maize silage	6.4^{a}	6.4^{a}	7.4^{b}	0.6	<0.001
	grass silage	4.4^{a}	4.3^{a}	5.0^{b}	0.4	<0.001
	NEL (MJ d^{-1})	137.5	138.1	143.4	7.2	0.028
	NEL (% of requirements)	109^{a}	107^{ab}	104^{b}	4.7	0.067
	DPI	1.47^{a}	1.47^{a}	1.59^{b}	0.08	<0.001
	DPI (% of requirements)	98	97	99	5	0.701
	RDPB (g d^{-1})	69	102	65	53	0.056
Performances	milk yield (kg d^{-1})	28.1^{a}	28.9^{a}	30.9^{b}	1.2	<0.001
	fat content (%)	4.33	4.33	4.45	0.24	0.260
	protein content (%)	3.19^{a}	3.10^{b}	3.09^{b}	0.08	0.002
	weight gain (kg d^{-1})	0.27^{a}	-0.27^{b}	0.16^{ab}	0.57	0.023

CONCLUSION:

Replacing conc. with wheat/CCM decreased roughage intake and total DMI. As such control had higher energy and protein intake and hence milk yield. Wheat slightly increased milk protein content compared to the other diets.

* contacts: sam.decampeneere@ilvo.vlaanderen.be; tel ++329 272 26 12; fax ++329 272 26 01