Optimum proportion of corn cob silage in total mixed rations for intensively-fed rosé veal calves

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Background

The increases in cereal prices have encouraged rosé veal calf producers to increased utilization of home-grown high-energy forage crops.

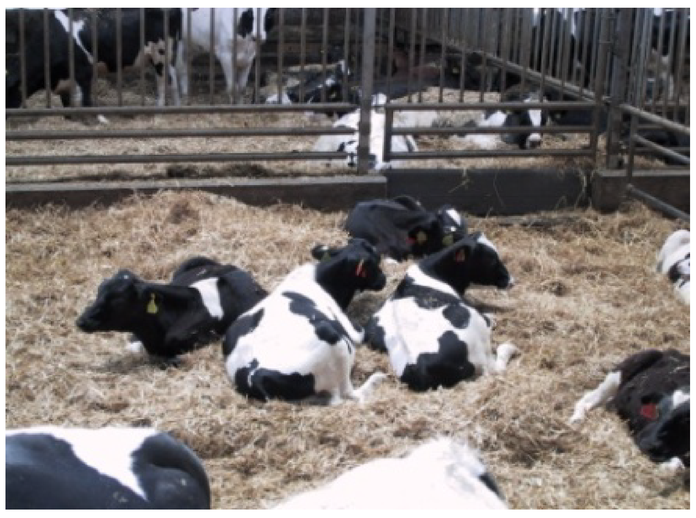
To be able to use a large proportion in total mixed rations (TMR), corn cob silage (CCS) has proven better than whole crop maize silage.

However, the optimal use of CCS in rosé veal calf production has not been thoroughly documented.

Objective

The overall objective was to study the effects of 20, 40 or 60% of Net Energy in TMR coming from Corn Cob Silage (CCS) on performance and carcass quality of Danish Holstein rosé bull calves slaughtered at 9½ months of age

Corn cob silage. Harvest autumn 2008. Innoculant added at harvest . Sialge made in plastic bags



Housing conditions – strawbedded pens

Materials and Methods

- A total of 66 Danish Holstein bull calves were purchased between 2 and 5 wks of age in two batches (spring 2009 and autumn 2009).
- Calves were fed milk-replacer (6.4 L/d) based on 60% skim-milk powder and weaned at 56 d of age. A calf starter concentrate and grass hay were available *ad libitum*. Corn cob silage was available from wk 3 of purchase.
- Calves were blocked according to herd of origin and randomly allocated to one of three treatment groups.
- After weaning of all calves (70 d of age and 93 kg BW), calves were moved and housed in 2 x 3 straw-bedded pens (10-11 calves per pen).
- Two calves were culled, so a total of 64 calves completed the experiment.

- Bull calves were offered one of the three TMRs *ad libitum*.
  - **CCS20: TMR with 20% of NE from Corn Cob Silage (CCS)**
  - **CCS40: TMR with 40% of NE from CCS**
  - **CCS60: TMR with 60% of NE from CCS**

- From 3 mo, feeding was gradually changed to the experimental diets.
- The CCS had a DM% of 54.1, 52 g digestible crude protein and 603 g starch/kg DM.
- Barley was used in the substitution with CCS, and the TMRs also included canola cake, soybean meal, sugar beet pulp, and mineral-vitamin mixture.
- TMR with 20 and 40% CCS also contained small amounts of barley straw and were water-adjusted so all TMRs contained 60% DM.
- All three TMRs had 17% protein, 21-22% NDF and 36-39% starch.
- Barley straw was available *ad libitum* but intake was not recorded.
- Individual feed intake recording was made from 156 kg BW (125 d of age) until slaughter at 385 to 400 kg BW or before 10 mo of age.
- Carcasses were graded according to EUROP.
- Feed costs and carcass payment were compared for the three treatments.

Conclusions

- it was possible to obtain the same high level of production performance with all three levels of CCS in the TMR
- Despite the 4% lower carcass payment for 60% CCS compared with 20% CCS, the 60% CCS might still be profitable due to the comparative 6% lower feed costs compared with 20% CCS.

Nutrient content of the TMRs fed to bull calves[1]

	CCS20	CCS40	CCS60
DM, %	60.8	60.2	59.9
NE, MJ/kg DM	7.5	7.5	7.4
Crude protein, g/kg DM	168	170	168
NDF, g/kg DM	211	211	223
Starch, g/kg DM[2]	392	377	359

[1]These rations were used for bull calves above 220 kg BW. In rations used below 220 kg BW, crude protein content was 191-194 g/kg DM and starch 305-327 g/kg DM.
[2]The final starch analysis of the CCS was lower than the initial value used to make the rations. Thus, there is an unintentional reduction in starch content from CCS20 to CCS60.

Body weight, growth rate, feed conversion efficiency, and feed costs

TMR	CCS20	CCS40	CCS60	*P*
Number of calves	21	21	22	
BW at start, kg	161	156	155	ns
Feed intake, kg DM/d	5.63	5.76	5.67	ns
FCE, Scand Feed U/kg ADG	3.5	3.8	3.9	*
BW at slaughter. kg	385	384	382	ns
ADG 125 d - slaughter, g/d	1567	1536	1506	ns
Age at slaughter, d	274	277	281	ns
Feed costs, €/d	1.12	1.10	1.02	-
Feed cost, €/kg gain	0.72	0.72	0.68	*

Carcass quality, premiums and payment

Carcass weight, kg	195	196	196	ns
Dressing percentage	50.6	51.0	50.8	ns
EUROP conformation	3.7	3.7	3.7	ns
EUROP fatness	2.3	2.2	2.2	ns
Lean/tallow colour	3.0	2.8	3.0	ns
Premiums, % of carcasses	85.7	81.8	66.7	*
Carcass payment, €/head	582	581	557	*

Results

- DMI (5.7 kg DM/d) and ADG (1.54 kg/d) were not affected but starch intake was 7% lower ($P<0.05$) for 60% than for 20 and 40% CCS.
- FCE was 10% lower ($P<0.05$) for 40 and 60% compared with 20% CCS.
- With the slaughter strategy used, carcass weight (196 kg) and EUROP conformation (3.7) and fatness (2.2) were not affected by CCS proportion.
- Fewer carcasses received premium grading (EUROP conformation >3.3) in the 60% CCS group leading to a 4% lower carcass payment.
- The calculated feed cost was 6% lower for 60% compared with 20% CSS.

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