Utilisation of contrasting diets in Blond d'Aquitaine young bull production

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The purpose of this study is to assess the effects of three finishing diets on digestive utilisation, rumen pH regulation, methane production, feed intake and growth performance of young Blond d'Aquitaine bulls.

1. Experimental design

An experiment was carried out using 30 weaned calves. Twenty-four calves were allocated to three treatment diets: hay and concentrate (HC), maize silage and concentrate (MSC) or ground maize-grain and straw (MGS). Animals had *ad libitum* access to the diets. Six animals were used for diet digestibility measurements. Animals were slaughtered after an eight-month finishing period when a commercial carcass weight for Blond d'Aquitaine (> 400 kg) was achieved. Statistical analysis utilised GLM and MIXED procedures (SAS).

2. Results

- Rumen gas products

Rumen pH was lower when feeding the maize-grain diet. With the hay diet, methane production was triple that observed with maize-grain diet (35.3 m^3 *vs* 12.5 m^3) (Table 1).

Table 1 : Methane (CH4) production and carbon dioxide (CO2) according diet type: hay and concentrate (HC), maize silage and concentrate (MSC) or ground maize-grain and straw (MGS).

Diets	HC	MSC	MGS	*P*
CH_4 (l/d)	199.4 a	227.3 a	93.0 b	<0.001
CH_4 % Gross Energy	6.6 a	7.2 a	2.5 b	<0.001
CH_4 (l/kg live weight)	0.47 a	0.53 a	0.22 b	<0.001
Total CH_4 production during finishing (m^3)	**35.3 a**	**34.1 a**	**12.5 b**	**<0.001**
CO_2 (l/d)	4806	5117	4793	NS

- Feed intake, Digestibility, Efficiency

Digestive interactions were evident with the maize-grain diet (Table 2). Voluntary feed intake increased during the finishing period but the extent of the increase depended on the dietary treatment. The average daily weight gain (ADG) increased with the energy concentration of the diet (1.49 to 1.86 kg/d) . Feed efficiency in terms of the Net Energy (UFV) was similar between diets (200 g of ADG/UFV) (Table 2).

Table 2 : Feed intake, growth performance and feed efficiency according diet type: hay and concentrate (HC), maize silage and concentrate (MSC) or ground maize-grain and straw (MGS).

Diets	HC	MSC	MGS	***P***
Finishing duration (d)	181 a	155 a	138 b	<0.05
Average Daily Gain (kg/d)	149 a	171 ab	186 b	<0.05
Total dry matter intake (kg/d)	8.07	8.24	8.10	NS
Diet organic matter digestibility (%) [1]	**70.6 a**	**74.0 b**	**75.3 b**	**<0.05**
Feed Unit Intake (UFV/d)	7.7 a	8.2 a	9.3 b	<0.05
Feed Efficiency (g ADG/UFV)	195	208	201	NS

[1] Obtained from digestibility measurements on bulls, organic matter digestibility of ground maize-grain and straw diet was expected 105 % higher from INRA Tables 2007

Young Blond d'Aquitaine bulls had a good utilisation of the high concentrate diets as evident from the high daily gain and feed efficiency.