

# Eating quality of Holstein bull calves fed **only grass or purely herbs** matches that of concentrate-fed veal calves

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## Introduction

Organic meat production from Holstein calves born in dairy herds require that the bull calves are raised outdoor at least 6 months a year, and on large quantities of roughage in the diet. This study aimed at elucidating if Holstein bull calves fed either purely grass or purely herbs prior to slaughter would differ in meat quality traits, fatty acid composition and sensory profile and if they differed in quality aspects from concentrate-fed veal calves.

## Materials and methods

Eleven Holstein bull calves raised on a concentrate-based diet until the age of 8 months, were fed either purely grass (Grass, n=6) or purely herb-based green feed for eight weeks (Herbs, n=5) and then slaughtered. At the day of slaughter six carcasses from traditionally 9-10 months old rosé veal calves were included as a control group (Con).

Table 1 Slaughter quality characteristics of bull calves fed either purely grass (Grass) or herbs (Herbs) compared with rosé veal calves (Con)

	Grass	Herbs	Con
Carcass weight, kg	178	177	197
EUROP conformation	2.7 <sup>a</sup>	2.8 <sup>a</sup>	3.7 <sup>b</sup>
Color	3	3	3

<sup>a,b</sup> values with different superscript are significantly different (P<0.05)

Table 2 Sensory characteristics of *M. longissimus dorsi* from bull calves fed either purely grass (Grass) or herbs (Herbs) compared with rosé veal calves (Con)

	Grass	Herbs	Con
Meat odour	6.3	7.6	6.5
Meat flavour	7.1 <sup>a</sup>	8.2 <sup>b</sup>	7.2 <sup>a</sup>
Juiciness	7.7 <sup>a</sup>	8.3 <sup>b</sup>	7.5 <sup>a</sup>
Tenderness	6.6	7.5	5.6

<sup>a,b</sup> values with different superscript are significantly different (P<0.05)

*M. longissimus dorsi* (LD) and *M. semimembranosus* (SM) was used to study color (Minolta), fatty acid and vitamin composition as well as sensory profiling after 10 days of ageing.

## Results

The bull calves fed either grass or herb-based green feed had a daily gain of 978 g per day the last 6 weeks prior to slaughter. They did not differ in any slaughter quality characteristics, but in comparison to concentrate-fed calves their conformation score was poorer, whereas there was no difference in the color of the carcass or in the meat between the three feeding strategies (Table 1). LD from Herbs was more juicy

and had a more intense meat flavor (table 2), but otherwise there were no differences in the sensory evaluation of either LD or SM between feeding strategies.

In contrast the composition of fatty acids (figure 1) and  $\alpha$ -tocopherol and  $\beta$ -carotene (figure 2) were more affected by the feeding strategies.

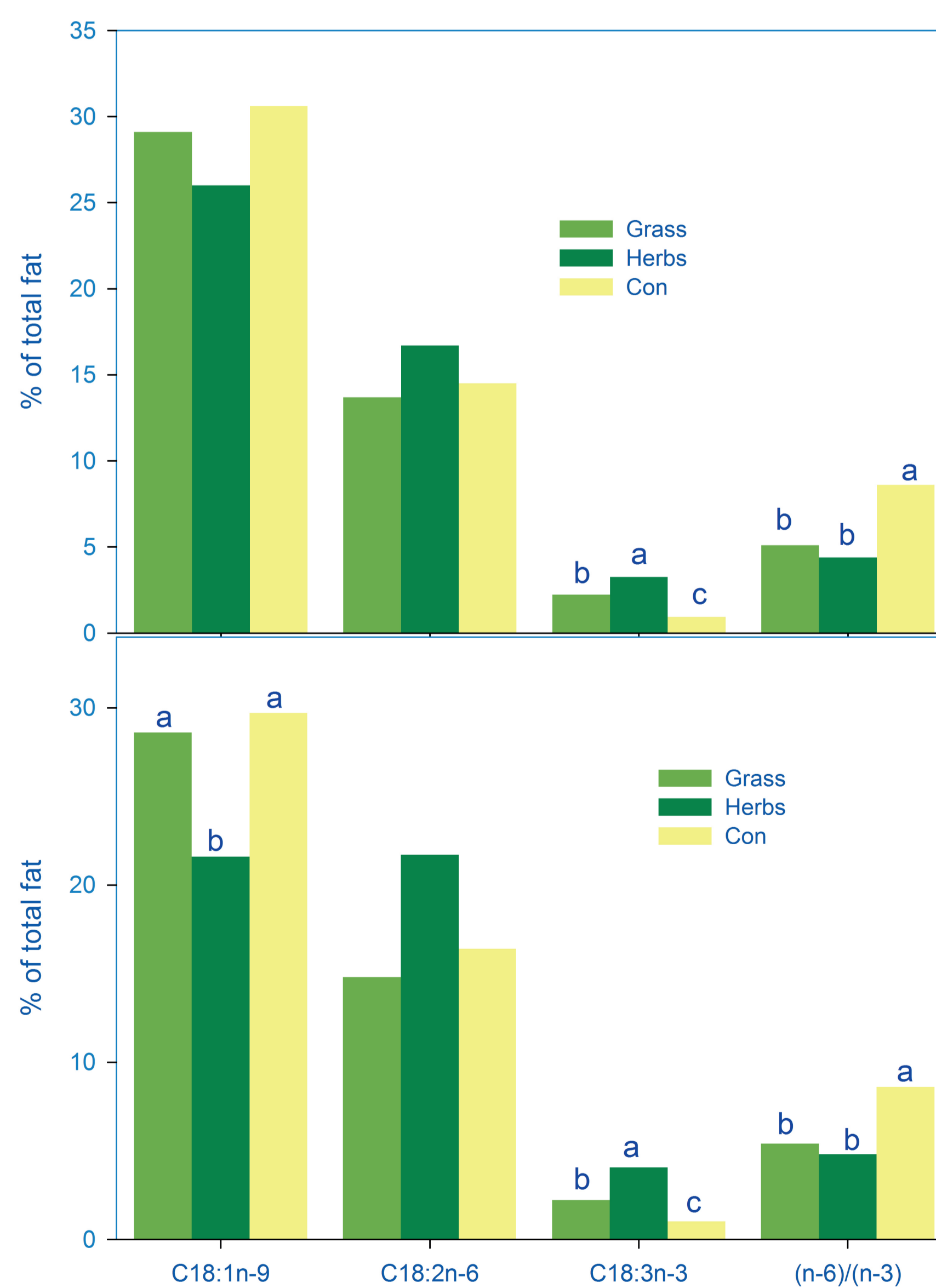


Figure 1 Content of oleic, linoleic and  $\alpha$ -linolenic acid relative to total fatty acids and (n-6)/(n-3) in *M. longissimus dorsi* (top) and *M. semimembranosus* (bottom) from bull calves fed purely grass (Grass) or purely herb based green feed (Herbs) compared with rosé veal calves (Con). <sup>a,b,c</sup> Columns with different letter within fatty acid/ratio are significantly different (P<0.05)

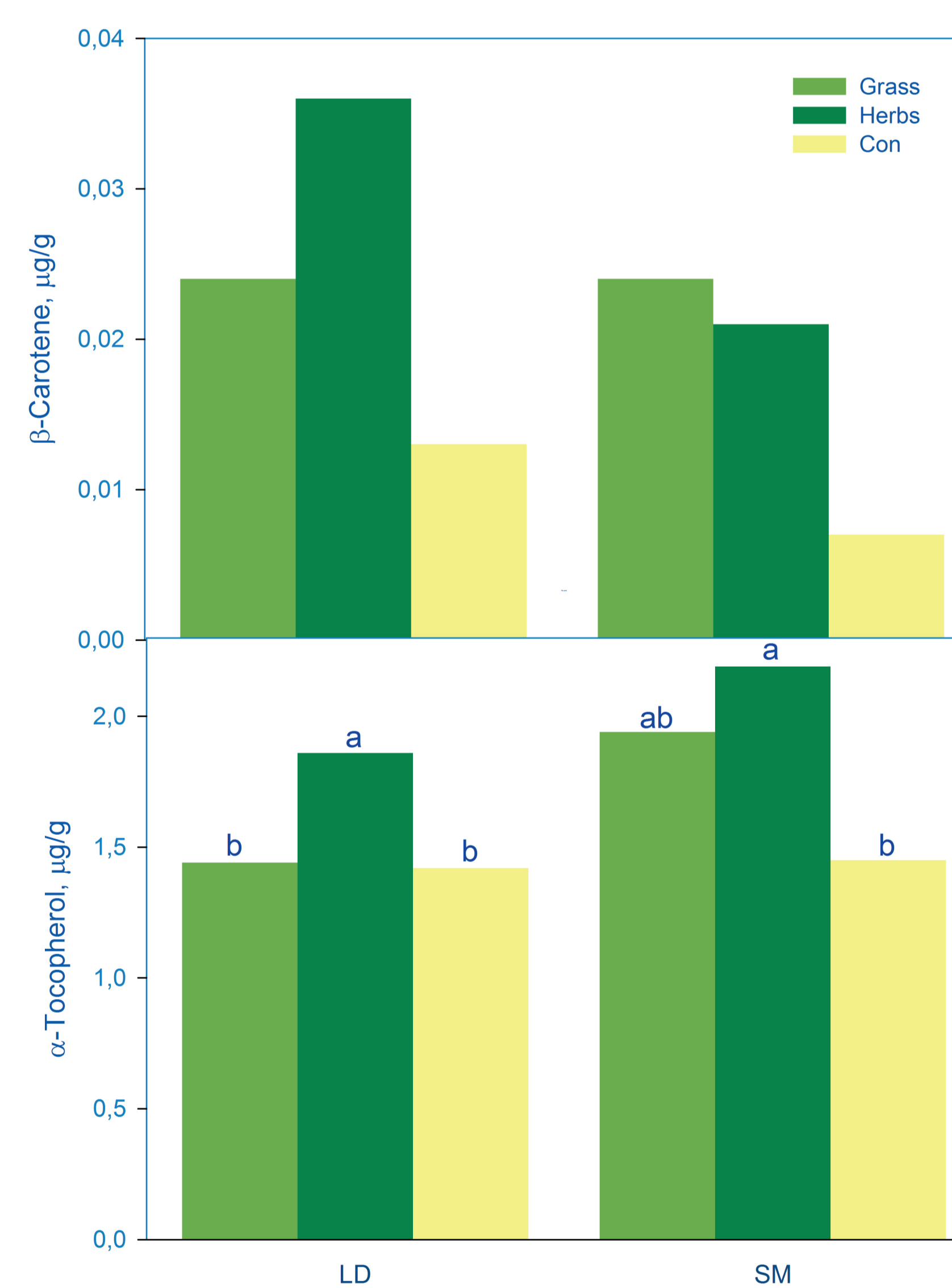


Figure 2 Content of  $\alpha$ -tocopherol (bottom) and  $\beta$ -carotene (top) in *M. longissimus dorsi* and *M. semimembranosus* from bull calves fed purely grass (Grass) or purely herb based green feed (Herbs) compared with rosé veal calves (Con). <sup>a,b</sup> Columns with different letter within muscle are significantly different (P<0.05)

## Conclusion

Finishing young bull calves for 6 weeks on purely grass or herb-based green feed in comparison with concentrate results in meat with similar color and sensory profile, but inclusion of herbs in the green feed increases the content of vitamins, linoleic and  $\alpha$ -linolenic acid, as well as an improved (n-6)/(n-3) ratio.

