

# Use of foster cows to produce rosé veal of spring-born dairy calves in an organic setting

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## 1. Introduction

Most non-replacement calves born by organic dairy cows in Denmark are sold to conventional rosé veal fattening.

Due to a requirement of milk-feeding until 3 months (mo) of age, grazing for 6 months per year, and at least 60% roughage in the fattening ration, very few calves are raised and slaughtered as organic. Furthermore, only a few traditional steers slaughtered at 2½ years of age are produced within the organic system.

Thus, currently no rosé veal with a low fat content and a light red colour of organic origin is available.

Our overall aim was to develop and test a novel organic beef production concept producing three types of beef; 8-mo rosé veal (reported in this abstract), medium red beef from 16 mo-steers, and red beef from 26 mo-steers (see fig. 1).

The hypothesis was that performance as well as meat quality would be as good as similar types of conventional beef.

To improve growth performance in the young calves, we utilized culled dairy foster cows to rear the calves.

## 2. Objective

To compare the performance, meat and eating quality of 8-mo organic rosé veal with conventionally-fattened 9-mo rosé veal calves.

## 3. Material and Methods

48 2-wk old Holstein bull calves were purchased from 5 private farms. Calves were fed milk by nipple before entering the experiment.

A total of 24 culled Holstein cows each received two spring-born 2-wk old Holstein bull calves. Following successful bonding indoor, dehorning, and castration at 1 mo, cow-calf-pairs were turned out.

Three pens were used each with 8 foster cows and their 16 calves. They were grazing a grass-clover sward for 4 mo, received supplemental TMR in feed rack (cows) and troughs (calves) and housed in the autumn.

At time of housing, half the calves were weaned, and the foster cows slaughtered. Among the 12 cow-pairs that continued, the 8 best-performing cow-calf pairs were pre-selected to be slaughtered at 8-months.

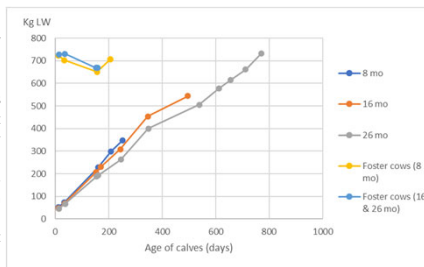
These 16 calves had access to the same TMR as their 8 foster cows, and were weaned at 6½ mo of age, and slaughtered at 8.2 mo (ORG).

At slaughter, carcass, meat and eating quality were measured.

Carcass, meat and eating quality were compared with that of 10 conventional 9-mo rosé veal calves (CONV, carcass weight 211 kg).

Actual birth weight not available but estimated to 40 kg. 12.5 d at entry.

Average birth date 30 April 2021 and date of slaughter was 10 January 2022.



**Fig. 1. Live weight by age of calves and foster cows. Foster cows (early- and late-weaned shown i upper left corner. Separate growth curves of 8-, 16-, and 26-mo old steers.**

**Table 1. Carcass characteristics of ORG and CONV calves**

	ORG	CONV	P-value
Calves, n	16	10	
Age, mo.	8	9-10	
Carcass weight, kg	180	211	***
EUROP conformation	3.2	3.6	ns
EUROP fatness	2.6	2.4	ns
pH – M. long. dorsi	5.62	5.72	*
pH – M. supraspinatus	5.70	5.67	ns

**Table 2. Meat quality of ORG and CONV rosé veal**

	ORG	CONV	P-value
Intramuscular fat, M. long. dorsi, %	2.25	2.04	ns
Intramuscular fat, M. supraspinatus, %	2.18	1.87	ns
Meat colour, <i>Id</i>			
L* (lightness)	39	39	ns
a* (redness)	18	19	ns
b* (yellowness)	7.3	7.4	ns

**Table 3. Eating quality of filet from ORG and CONV rosé veal**

	ORG	CONV	P-value
Meat smell	9.5	8.9	ns
Meat taste	9.1	8.3	*
'Green' taste	4.0	4.3	ns
Tenderness	8.5	6.1	*
Juiciness	10.5	9.9	ns

## Growth rates of ORG calves in periods

ADG born to entry of exp.: 1074 g/d (12.5 d)  
 ADG entry to weaning: 1258 g/d (196 d)  
 ADG weaning to slaughter: 1103 g/d (42.5 d)  
 ADG born to slaughter: 1220 g/d (251 d)

## Conclusions

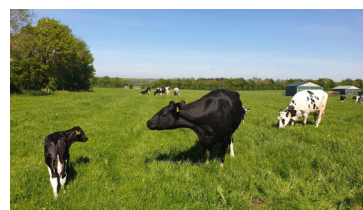
We have shown that a high growth rate and high-quality organic rosé veal can be produced by utilizing foster cows and a one season pasture period.

## Perspectives

The production system needs to be refined, like utilizing beefdairy offspring, and utilizing both steers and heifers.

Needs to be tested for all year-round born calves.

The actual ages at slaughter (i.e., carcass weight and fatness) and the proportion of steers in each category need to be decided by the actual production conditions (pasture, other feeds, barns etc) and market conditions (i.e., price).



**Fig. 2. Foster cow-calf pairs at pasture**

## 4. Results

There were no health-related issues with the 8-mo calves (ORG)

With use of good yielding foster cows, a LW at weaning of 299 kg was attained

ADG from birth to slaughter was 1.23 kg/d, and LW at slaughter was 346 kg (min 299, max 399 kg)

Carcass weight was 180 kg (157-207 kg) and Net gain of 630 g/d

Carcass weight was higher for CONV (211 kg)

Foster cows lost 2-3% LW across the 6½ mo of experiment

Feed efficiency of ORG calves alone was high 3.9 SFU/kg LW gain, but if the foster cows feed intake and LW loss were included, FCR was 6.9 SFU/kg LW gain. (SFU: Scand. Feed Unit = 7.89 MJ NEL)

In comparison, the FCR of the intensively-fed conventional bull calves (CONV) was approximately 4.4 SFU/kg LW gain.

EUROP conformation (ORG 3.2 vs CONV 3.6) and EUROP fatness (2.6 vs 2.4) were similar.

Meat quality (intramuscular fat and colour measures: L\*, a\*, and b\*) was similar.

Eating quality showed some differences: ORG had more intense taste and was more tender than CONV (both P<0.05) with no difference in smell, 'green' taste and juiciness.

The hypothesis was confirmed, as the study shows that it is possible to produce a high-quality rosé veal product in an organic setting

## About the GroBEat project - High quality Grass-fed Organic Beef for sustainable Eating behavior

The GroBEat project proposes an innovative organic beef production system that offers a diversity of beef products (A= 8-mo rosé veal, B=16-mo young steer, and C=26 mo-old mature red meat steer). The production system is based on offspring from dairy cows, and which scores high on animal welfare, biodiversity and climate issues thus addressing specific criteria of major importance for the consumers. Furthermore, the high level of meat- and the sensory quality together with the storytelling of the production system address that "less is more", which is supposed to facilitates healthier eating habits, while ensuring well-being, and providing the organic dairy sector with improved credibility for "license to produce". The GroBEat production system is based on steers and includes calf rearing by a foster cow for up to 6 months, use of low energy density roughage during winter, and utilizes extensive pasture for weaned steers. The system takes advantage of the variation in growth capacity between animals by slaughtering 1/3 of the best-performing calves at 8 mo as high value rosé veal (A), another 1/3 of the steers at 16 mo as young beef (B), and the last 1/3 of the steers at 26 mo as mature beef (C). This gives three well characterized products compared with the current 9-10-mo old intensively-fed conventional rosé veal and the traditional 24-26 mo old organic beef from steers.