

# Improvement of the selenium content in beef meat by feeding ingredients high in selenium.



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## Introduction

In Belgium, beef meat is produced to a large extent from young growing fattening bulls of the doubled muscled Belgian Blue breed. They are offered high energy diets based either on whole plant maize silage or on sugar beet pulp. The present experiment was a comparison of a fattening diet in which three major ingredients (barley, spelt and linseed meal) were either high or low in selenium.

## Materials and methods

- A feeding trial was carried on with young fattening bulls offered a diet which was high or not in selenium.
- The selenium content in the diet was 106 µg/kg for the control diet and 307µg/kg for the enriched diet.
- The other chemical components of the diet were unchanged, the average crude protein content being 16% and the ether extract content 3%.



## Results and discussion

- There were no differences in the animal performances, in slaughter characteristics and meat characteristics.
- There were no differences in the chemical composition of meat (protein content of 87.3 and 92.9 %, ether extract of 2.2 and 1.7%)
- The Se concentration in meat was two times higher in the selenium group than in the control (286 and 486 µg Se/kg DM in the Longissimus thoracis and Rectus abdominis muscles).

## Conclusion

From this fattening trial, it appeared possible to increase the selenium content in meat using ingredients (barley, spelt and linseed meal) with high content in selenium. It appeared also that, on the whole, Se supplementation did not affect animal performance, slaughter characteristics or chemical composition of meat.

|                 | Control diet | Selenium diet |
|-----------------|--------------|---------------|
| Barley          | 24.0         | 24.0          |
| Sugar beet pulp | 45.4         | 40.0          |
| Spelt           | 13.0         | 13.0          |
| Soya bean meal  | 13.0         | 3.0           |
| Linseed meal    | -            | 15.4          |
| Molasses        | 3.6          | 3.6           |
| Mineral Mixture | 1.0          | 1.0           |

Table 1. Composition of the fattening diets (% of fresh materials)

|                          | Control diet | Selenium diet | P>F   |
|--------------------------|--------------|---------------|-------|
| Initial live weight (kg) | 432.8        | 431.6         | 0.944 |
| Final live weight (kg)   | 612.2        | 600.3         | 0.320 |
| Total gain (kg)          | 180.5        | 168.7         | 0.302 |
| Duration (days)          | 123.2        | 121.1         | 0.781 |
| Cold carcass weight (kg) | 363.0        | 364.0         | 0.820 |
| Killing out %            | 66.4         | 66.6          | 0.760 |

Table 2. Animal performances and slaughter characteristics

|                                 | Control diet | Selenium diet | P>F   |
|---------------------------------|--------------|---------------|-------|
| Tenderness (N)                  | 32.1         | 34.2          | 0.275 |
| L*                              | 41.0         | 42.3          | 0.110 |
| Protein LT muscle (%)           | 87.3         | 92.9          | 0.120 |
| Ether extract LT muscle (%)     | 2.2          | 1.8           | 0.110 |
| Se content (RA muscle, µg/kgDM) | 248.0        | 462.5         | 0.000 |
| Se content (LT muscle, µg/kgDM) | 324.8        | 509.2         | 0.000 |

Table 3. Meat quality