

# Energy value of NUTRIOSE®FB 06

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## INTRODUCTION

Long term consumption of imbalanced diets poor in dietary fibres resulted in the prevalence of several pathologies, among them obesity and diabetes. It is well-known that low digestible carbohydrates and dietary fibres have many beneficial effects especially on energy intake and digestive physiology. The aim of the study was to determine the digestive effects of NUTRIOSE®FB 06, its metabolizable energy and to calculate its net energy value using different prediction equations worldwide recognized.

## MATERIALS AND METHODS

### Subjects

- ➔ 10 healthy men
- ➔ 23.6 ± 2.6 years old
- ➔ BMI : 22.3 ± 1.6 kg.m<sup>-2</sup>

### Experimental design

- ➔ Two experimental periods lasting 31 days according to a cross over design separated by a 4 weeks washout period
- ➔ Each experimental period comprised 18 adaptation days to the tested products Dextrose (reference product) and NUTRIOSE®FB from 20 g DS (dry substance)/day to 100 g DS/day
- ➔ Followed by a 13 day constant intake of both products
- ➔ Each balanced period covered the last 11 days

### Parameters evaluated

- ➔ Faeces output
- ➔ Tolerance of the tested product
- ➔ Metabolizable (MEV) and net (NEV) energy values of NUTRIOSE®FB. MEV was evaluated according to a formula that was published by the same team in 2002 (Sinaud et al., 2002). NEV was estimated using 2 recent prediction equations (Livesey, 2001).

## RESULTS

### Tolerance

- ➔ The volunteers completed the study having ingested on average 99.8 g DS/day of NUTRIOSE®FB 06 and 104.7 g DS/day Dextrose after the adaptation period
- ➔ Summing up of digestive symptoms showed that ingestion of 100 g DS per day of NUTRIOSE®FB 06 did not cause severe digestive disorders

### Effect on faeces output

**Table I: faecal output parameters following 100g DS ingestion**

| Diet                          | Dextrose |      | NUTRIOSE®FB 06 |      | p    |
|-------------------------------|----------|------|----------------|------|------|
|                               | mean     | sd   | mean           | sd   |      |
| Number of defecation/day      | 0.76     | 0.04 | 0.84           | 0.04 | NS   |
| Wet faecal weight (g/d)       | 92.8     | 10.4 | 130.6          | 10.4 | 0.05 |
| Faecal dry matter content (%) | 24.2     | 0.08 | 28.8           | 0.08 | 0.05 |
| Dry faecal weight (g/d)       | 22.7     | 3.2  | 37.4           | 3.2  | 0.05 |

### Digestion

The digestibility in the small intestine was estimated at 15%. The faecal NUTRIOSE®FB residue output average 9.2 g per day. Consequently the apparent digestibility of NUTRIOSE®FB was 90.8% and about 76% was fermented.

### MEV and NEV of NUTRIOSE®FB 06

MEV averaged 14.1 kJ/g DS. That is 8% less than dextrose (15.6 kJ/g DS) and 14% less than sucrose and starch (16.7 kJ/g DS). NEV estimation of NUTRIOSE®FB averaged 8.8 kJ/g DS.

## CONCLUSION

Ingestion of NUTRIOSE®FB 06 did not induce severe digestive disorders even on the long term, except gas emission for intakes **above 50 g per day**. This observation confirms the exceptional digestive tolerance of this dietary fiber. Wet and dry stool outputs increase significantly. The metabolizable energy value was 14% less than those tabulated for sucrose and starch. The net energy value was 8.8 kJ/g DS (2.1 kcal/g) as compared to 16.7 (4 kcal/g) for starch or sucrose.

In conclusion, NUTRIOSE®FB can be used as a bulking agent and for fiber enrichment of foods up to 50 g per day for totally digestible carbohydrates without causing any digestive disorders in healthy subjects. It would reduce intestinal transit and energy intake. This food resistant dextrin is consequently a good opportunity to light foods in term of energy.

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