

# Industrial thermal processed meat stew had similar nutritional values as homemade cooked

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The consumption of ready meals has increased steadily during the last years. Such meals are used by large groups in the community and it has been questioned if these meals can meet the nutritional needs. Many ready meals are today produced with technologies that give high retention of valuable nutrients of the products and they can be comparable with homemade food.

## Material and methods

**Ingredients:** Meat stew was made of onions, rutabaga, carrot, potato, leek and celery, potato flakes, vegetable broth, chicken broth, ground black pepper, thyme and water. The meat was lightly salted, checkered pork.

**Processing:** The meat stew was produced commercially by a ready meal producer (Fjordkjøkken AS, Norway) in a retort (Steriflow, Roanne, France) with a program meeting a pasteurization value of  $P_{90\text{C}}^{7.5} = 10$  min (obtained shelf life of 30 days). The samples were stored for 5 weeks and reheated before analysis.



Figure 1 Temperature logging in industrial produced stew in the autoclave



Figure 2 Home made cooking in cooking pans and packaged products stored at chilled conditions..

Identical ingredients were used for “homemade cooking” in cooking pot followed by packaging (450 g Færch tray) and chilling (4 °C within 2 h). The commercial products were stored at 4 °C and analysed after 1, 2 and 5 weeks.

**Analyses:** The products were analysed for energy, water content, ash and nutrients; protein, sugars, fat, carbohydrates and fiber. Vitamins analysed were vitamin A, several vitamin Bs, folate and vitamin C. Further, the minerals iron, sodium chloride, zinc, copper, phosphorus were determined.

## Results and discussion

For 17 out of 18 parameters no significant difference were found between homemade stew and stew industrially processed and stored one week before reheating. There were slight variations between parallels that can be attributed to differences in the commodity composition of the individual analysis samples.

Table 1 Nutritional analysis of home made and industrial produced meat stew.

	In 100 g	Mean	Mean
Energy	kJ	304,50	276,15
Fat - total	g	2,22	1,80
Saturated Fatty acids	g	0,73	0,59
Monounsaturated FA	g	0,98	0,79
Polyunsaturated FA	g	0,42	0,34
Carbohydrates	g	7,50	7,90
Saccharides	g	1,92	1,92
Sugar-total	g	1,60	1,70
Dietary fiber	g	1,45	1,35
Protein	g	4,80	3,84
Sodium chloride	g	0,67	0,78
Vitamin B6 (Pyridoksine)	mg	0,07	0,07
Vitamin B9 (Folic acid)	µg	9,70	9,90
Vitamin B12 (Kobalamine)	µg	0,80	0,60
Vitamin C	mg	0,25	0,25
Vitamin A (Retinol)	µg	<0,60	<0,60
Fe (Iron)	mg	0,40	0,40
Zn (Zink)	mg	0,60	0,50
P (Phosphorous)	mg	49,00	54,00

There were no significant differences in nutrient content during cold storage in industrial retorted products from week 1 and week 5. Week 2 differed on some parameters, with higher values. The overall picture is little decline in nutrient content within 5 weeks of cold storage. In both production methods, vitamin A and C were below detection limit.

## Conclusion

- The nutritional values in meat stew that was home made was compared with industrial produced meat stew.
- 17 of 18 nutritional analysis parameters were significantly similar in the two processing methods.
- The nutritional value of the industrial retorted products was retained for 5 weeks at cold storage.

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