

Effect of horse meat consumption on iron status, lipid profile and fatty acid composition of red blood cell membrane: preliminary study

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INTRODUCTION

Italy is the highest consumer of horse meat among all European countries. Compared to others, horse meat is very high in iron (1), one portion (150 g) providing between one-third and one-half of daily recommended dietary intake.

Horse meat is very low in fat and cholesterol (about 20% less) and it is a good source of polyunsaturated fatty acids such as linoleic and α -linolenic acid (2). Limited data are available on the effect of the regular consumption on lipid profile, iron metabolism and fatty acids profile.

AIM

Evaluation of the effect of horse meat consumption on lipid profile, iron status and fatty acid composition of red blood cells membrane in healthy subjects.

MATERIALS AND METHODS

STUDY DESIGN

- 52 male healthy volunteers (age 20-50, BMI 24.4 \pm 3.8) were enrolled.
- 26 subjects consumed two portions of 175g/week of horse meat (test group), 26 subjects consumed other meats (control group).
- No vegetarians, no restricted diet.
- At the beginning and after 45 and 90 days, venous blood samples were collected.

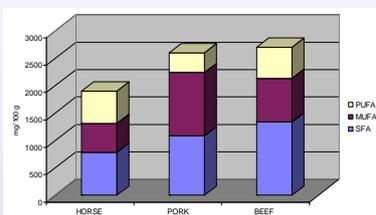
VARIABLES UNDER STUDY

- **Characterisation of horse meat:**
 - Lipid, iron and fatty acid profile
- **Blood analysis**
 - Plasma lipid profile, iron and cholesterol.
 - Fatty acids composition of red blood cell membrane

Nutritional values of meat (100 g)	Horse	Pork	Beef
Iron (mg)	3.8	1.7	2.3
Lipids (g)	2.2	2.7	2.7
Insaturation index	106	77	85
Aterogenic index	1.8	1.6	2.1
Trombogenic index	0.6	1.5	1.8

RESULTS

Figure 1- Fatty acids in meat products

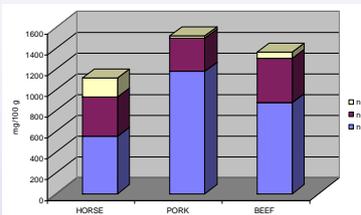


- During the experimental period all the biochemical parameters were within the normal range.
- All data were normalised respect to time zero and the percentage of variations were considered for the statistical analysis.

LIPID, CHOLESTEROL AND IRON STATUS

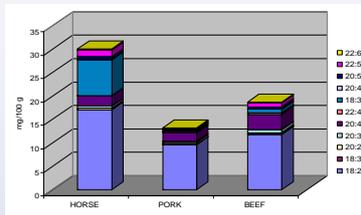
- No evident effect on triglyceride, LDL and HDL cholesterol profile was demonstrated after 90 days of treatment in the horse meat vs control group.

Figure 2- Polyunsaturated fatty acids in meat products



- The percentage variation (time 90 vs time 0) were significantly different between test and control groups for the content of total cholesterol (-5.6 \pm 2.7 vs -1.6 \pm 2.0; p<0.05).
- A significant variation was also observed between test and control groups for transferrin (-5.7 \pm 0.9 vs -1.8 \pm 1.1; p<0.05).
- An increase (but not significant) occurred for sideremia after horse meat consumption.

Figure 3- Omega 3 and 6 in meat products



FATTY ACID COMPOSITION OF RED BLOOD CELL

- A significant variation were observed between test and control groups for the content of docosahexaenoic acid (12.6 \pm 2.5 vs 6.9 \pm 1.3; p<0.05).
- A significant variation were also observed for the content of omega-3 fatty acid (12.3 \pm 2.5 vs 5.0 \pm 1.0; p<0.05).

CONCLUSION

Horse meat is an important source of omega 3 and iron. With respect to other meats, it is very low of saturated fatty acids but rich of PUFA like fish and other seafood.

A regular consumption of horse meat seems to improve omega 3, docosahexaenoic acid (22:3n6), iron status and to reduce total cholesterol. Therefore, a regular consumption of horse meat with respect to other read meats, may improve fatty acid profile and in particular modulate PUFA, the most useful fatty acids to maintain nutritional status and the protective effects.

REFERENCES

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