FOCUS : JSMTV

Protein intake of young and elderly French people living at home

S. Rousset1, M. Brandolini2, J.-F. Martin1, S. Droit-Volet3, D. Bonin4, P. Lhoutellier4, H. Simon5, V. Grandjean6, Y. Boirie2

Key words:
Protein intake, age, sex, dietary survey.

INTRODUCTION

Today, 15% of the French population is older than 65, and this percentage is likely to increase to 17.3% in 2010 and to 21.6% in 2020 (DINH, 1991). The Seneca study (DE GROOT et al., 1996) showed that 16% of people aged 70 years lost at least 5 kg in the following 5-year-period. It is well known that elderly people have a reduced appetite which may induce a risk of denutrition. The decrease in food intake in elderly has different causes such as decreasing physical activity associated with muscle and strength loss, social isolation, a loss of sensory capabilities (taste and olfaction) and digestive troubles linked to slower gastric emptying. A recent survey (TMO, 1996) highlighted that 25% of people reduced their beef consumption during the last years. This decrease was higher in people aged over 50 years and in women. Some elderly people started to adapt their food intake to their decreasing physical activity (DETOMASIO, 1996). However, as they were unaware of the regenerative function of food, they progressively reduced their food intake until they were suffering from protein denutrition. The recommended allowance for elderly people is

1. Institut National de la Recherche Agronomique, Station de Recherches sur la Viande, Theix, 63122 Saint Genès Champanelle.
2. Laboratoire de Nutrition Humaine, BP 321, 58 rue Montalembert, 63009 Clermont-Ferrand Cedex 1.
3. Laboratoire de Psychologie Sociale de la Cognition, CNRS - UMR-SA 6024 34, Avenue Carnot, 63037 Clermont-Ferrand.
4. Association de Développement de l’Institut de la Viande, 2, rue Chappe 63039 Clermont-Ferrand.
equal to or slighter higher than that of young people 1.0 g.kg⁻¹.d⁻¹ (CYNOBER et al., 2000). This fact should involve increasing the protein/energy ratio when food intake decreases in elderly people. Moreover, since they suffer more from chronic diseases, elderly people need more energy and protein to maintain a healthy state (JEANDEL & DEBRY, 1997). As protein consumption is determinant in maintaining a good health status, we carried out an inquiry into the distribution of the daily consumption of protein-containing foods in elderly and young people.

**MATERIALS AND METHODS**

Three hundred and thirty subjects took part in this survey: men and women, young (20-30 years) and old (65-70 years). The consumption of protein-rich foods at each meal was assessed by questionnaire during 7 consecutive days in Spring 2000. The questionnaire which was accompanied by instructions for completing it, comprised 6 headings: dairy products, meat products, fish, eggs, ready-made meals and starchy foods. The quantities of each food were assessed by the subjects themselves from a photo album, designed specifically and already validated and used in a large French epidemiological study (SU.VI.MAX, 1994).

**RESULTS**

**Height, weight, body mass index of the consumer sample and protein intake**

The mean heights of the older and the younger groups of men were 1.72 m and 1.78 m respectively and significantly different. Their average weights were 75.6 kg and 71.8 kg, respectively. For the older and the younger groups of women, differences in height and in weight were also significant (1.60 m and 1.65 m; 62.5 kg and 57.6 kg, respectively).

The body mass index (BMI) was higher for the elderly (25.0) than for the younger people (21.9).

The mean protein intakes were equal to 1.20 and 1.21 for elderly men and women and 1.39 and 1.14 g.kg⁻¹.d⁻¹ for younger men and women, respectively. The difference in protein intake per unit of body weight between young and elderly subjects was large in men and not significant in women. Fifty three percent of the elderly people consumed less than 1.20 g.kg⁻¹.d⁻¹, 25% less than 1.0 g.kg⁻¹.d⁻¹ and 6% had a protein intake less than 0.8 g.kg⁻¹.d⁻¹. Thus a protein intake, less than that recommended, was more frequent in the elderly than in the younger subjects.
Protein intake variety for the whole sample

Meat products were the main source of protein intake (35.0%), then starchy foods and dairy products (25% and 23%), then fish (10%), ready-made meals (5%) and eggs (3%).

Effect of age on protein intake

More fish and starchy foods were consumed by elderly people, and meat products and ready-made meals by young people.

Age *sex interaction on protein intake

We observed a reduction in protein intake and meat consumption in the older men compared to the younger men. Conversely, protein intake, consumption of starchy foods and dairy products were higher in the older women compared to the younger women.

Sex effect on protein intake

Protein intake and consumption of starchy foods, meat and dairy products were lower in women than in men.

Types of eating patterns

The cluster analysis showed 7 eating patterns differing in terms of protein level and distributed among meat-products, dairy-products, fish, eggs, starchy foods and ready-made meals (Figure 1). Small and big eaters of protein emerged from this cluster analysis. The first cluster included 87 people who ate little protein (0.9 g.kg\(^{-1}.d^{-1}\)) and a little of each type of food. The second and third clusters were composed of 112 moderate consumers of protein (1.1 g.kg\(^{-1}.d^{-1}\)) but who ate a large quantity of either starchy foods or meat products. The fourth, fifth and sixth clusters (123 subjects) consumed a lot of protein (1.4 g.kg\(^{-1}.d^{-1}\)) either from starchy foods and dairy products or from meat products. The pattern of the last cluster (8 subjects) was different to the mean of the panel. They ate much more protein (1.9 g.kg\(^{-1}.d^{-1}\)) and 50% of the protein were from meat products. The percentage of male subjects increased progressively from 15% in cluster 1, 22%, 53%, 58%, 75%, 79% and 100% in cluster 7.

So, groups of small or big eaters of protein were identified from this cluster analysis. The young women composed predominantly the first 2 clusters and the young men the last 3 clusters having high protein intake and meat consumption. The eating pattern discrimination was smaller in elderly than in young subjects: older women were distributed in the first clusters while older men belonged to intermediate clusters. The highest difference in food consumption between clusters was observed for meat products, the protein intake of which varied between 25 and 50% of the total protein intake.
CONCLUSION

This survey carried out in Spring 2000 showed that meat products accounted for the highest part of protein intake (35%), then starchy foods and dairy products (24% and 23%), then fish (10%), ready-made meals (5%) and eggs (3%). Age and gender factors affected protein intake. Elderly people consumed more starchy foods and fish whereas young people ate more ready-made meals and meat products. Men consumed more protein from meat products and starchy foods than women. Differences in protein intake between men and women
were smaller in elderly because variations in food pattern were relatively low. Moreover, the study showed that 25% of elderly people consumed less than 1 g protein.kg⁻¹.d⁻¹ and did not follow the recommended allowance. This work reveals a population at risk of under-consumption of protein and highlights the importance of informing the elderly about the nutritional benefits of protein.

ACKNOWLEDGEMENTS

We thank gratefully Direction Générale de l’Alimentation (French Ministry of Agriculture) for financial assistance of our research program “Aliment-Qualité-Sécurité”.

REFERENCES


