Toward the development of functional foods for elderly

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Extensive research deals on the development of functional foods. These foods claim to improve human health by providing benefits that going beyond the basic nutritional functions [1]. In this context, this study aims to design a food model which responds to physiological needs of elderly *i)* by a high content in easily digestible proteins *ii)* and the addition of ingredients that may reduce chronic disease risk *iii)* while providing a taste and aroma adapted to ageing of sensory function.

Several meat emulsions, Frankfurter-type, were manufactured with pork lean and backfat coming from animals feed with traditional plant sources rich in omega 3. Meat proteins are efficient to stimulate muscle protein synthesis in elderly subjects due to a favourable balance in indispensable amino acids and their high digestibility [2].

Five different meat emulsions were prepared to assess the effect of *i)* the cuttering duration, *ii)* the low fat content and *iii)* the addition of psyllium or tapioca starch, on the size, the form and the distribution of fat droplets (Fig. 1). Psyllium was added for its health benefit in prevention to chronic diseases and for its emulsifying power [3]. Tapioca starch was used as a fat replacer in order to improve the flavour and juiciness by its capacity to retain moisture [4]. Changes of fat droplets, known to alter the sensory perception in mouth [5], were determined using microscopy techniques.

a)	C/LF	C/HF	F	F/FP	F/TS
Cuttering duration	5 min	5 min 3	11 min	8 min 3	8 min 3
Backfat	14	27	14	14	14
Meat	66	54	66	66	66
Plasma	3	3	3	3	3
Nitrite salt	2	2	2	2	2
Spices	0.3	0.3	0.3	0.3	0.3
Lactose	0.5	0.5	0.5	0.5	0.5
Ice	14	14	14	11	11
Psyllium	0	0	0	3	0
Tapioca Starch	0	0	0	0	3

C/LF, control with low fat content; C/HF, control with high fat content ; F, Frankfurters with long time of cuttering ; F/FP, Frankfurters + psyllium fibers; F/TS, Frankfurters + tapioca starch.

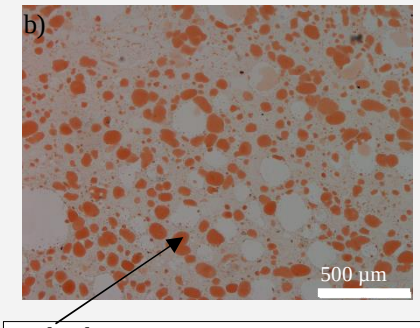

Fig. 1: (a) Formulation of Frankfurters (g/100g); (b) Determination of the size and form of the fat droplets using light microscopy (red oil staining).

The fat droplets were strongly affected by the cuttering duration. An increase of cuttering time reduced significantly the size of fat droplets. In contrast, the fat droplets were slightly altered by the reduction of fat content and the addition of psyllium or tapioca starch. This research allowed developing a relevant food model in combining technological, nutritional and organoleptic considerations.

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