



Examining heterogeneity in elderly consumers' acceptance of carriers for protein-enriched food: A segmentation study



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ABSTRACT

Elderly face an increased risk of nutritional deficiencies due to reduced appetites and increased nutritional needs. The development of appealing enriched functional foods holds a great potential for improving the nutritional status of this group of consumers. However, the elderly population is strongly heterogeneous, which poses a challenge to fulfilling their nutritional needs. Therefore, this study aimed to illustrate and examine the heterogeneity in elderly consumers' acceptance of carriers for enrichment. In an online survey, respondents ($N = 303$, $M_{\text{age}} = 66.9$) were asked to rate their willingness to trial purchase a set of carriers enriched with protein, that varied systematically in terms of *healthiness* (healthy vs. unhealthy), *novelty* (novel vs. traditional), and *meal type* (meal component vs. snack). Overall, respondents reported low willingness to purchase protein-enriched foods and indicated that they preferred to consume more protein-rich conventional foods, should they need to increase their protein intake. The identification of heterogeneity in carrier acceptance, especially regarding product novelty and meal type, suggested that there was room for improvement in product acceptance. Indeed, willingness to trial and repeat purchase protein-enriched carriers were considerably higher for product formats that were tailored to six subgroup of respondents. These findings underline the merits of taking heterogeneity into account when commercialising functional foods among elderly. Future studies may want to look into additional ways to reduce scepticism among elderly regarding the use of enriched food.

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1. Introduction

During the last decades, the elderly population has strongly increased relative to younger populations and it has been predicted that the proportion of elderly aged over 65 in Europe will rise up to 30% in 2060 (European Commission, 2009). Because of this rise, scientists are devoting increasing attention to the physical and psychological wellbeing of elderly. One of their main concerns is the high incidence of protein deficiency among elderly, especially among frail elderly (Brownie, 2006; Wolfe, Miller, & Miller, 2008). Both healthy and frail elderly are argued to require greater amounts of protein than younger adults do, because the elderly body metabolises protein inefficiently (Bauer et al., 2013; Morais, Chevalier, & Gougeon, 2006; Wolfe et al., 2008). Inadequate intake of protein may threaten various bodily functions (Morais et al., 2006) and is a strong independent predictor of mortality in elderly

people regardless of whether they live independently or in nursing homes (MacIntosh, Morley, & Chapman, 2000). Higher protein intake among healthy elderly results in improved bodily function and quality of life (Wolfe et al., 2008), and may help prevent protein malnutrition at a later age (Morais et al., 2006).

1.1. Functional foods

Different from elderly in geriatric care, who often receive nutritional support (Stratton et al., 2005), elderly who are still living independently generally have to manage their food intake without medical help. The functional food market may support this latter group of elderly in increasing their protein intake. Functional foods are food products with a nutritional composition that may reduce the risk of diet-related diseases or enhance physiological functions (Diplock et al., 1999). These foods may be whole foods with naturally occurring nutritional benefits (e.g., lycopene in tomatoes), foods that are enriched, fortified or enhanced with nutrients (i.e., nutrients are added or nutrient levels are increased, from now on collectively referred to as "enriched foods") or foods that are

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otherwise altered (i.e., from which nutrients are removed, reduced or replaced, such as in light products) (Spence, 2006).

Protein-enriched meals have already been successfully used to increase protein consumption among hospitalised elderly (Lorefält, Wissing, & Unosson, 2005; Stelten et al., in press). Developing and commercialising protein-enriched foods that appeal to independently living elderly could help these elderly consumers to also meet their increased need of protein. As a result, these products could benefit public health by helping prevent nutritional deficiencies, improving elderly's quality of life (Brownie, 2006) and decreasing healthcare costs (Marinangeli & Jones, 2013). In addition, enriched foods are interesting from the perspective of the food industry, because elderly are willing to spend money on innovative products that meet their needs (e.g., what they want to be delivered) and wants (i.e., how they want it to be delivered) (Leek, Szmigin, & Carrigan, 2001; Yoon & Cole, 2008).

Functional ingredients, like protein, can be incorporated in various food products (i.e., carriers), giving rise to many opportunities for protein-enrichment in the functional food market. However, not all combinations of ingredients and carriers appeal to consumers to the same extent (van Kleef, van Trijp, & Luning, 2005) and the elderly consumer population is strongly heterogeneous in terms of their needs and wants (Moschis, 2003), including their food preferences (Locher & Sharkey, 2009; Rozin, 2006; Sobal, Bisogni, Devine, & Jastran, 2006). More insight into this heterogeneity will help marketers to better understand the wants and needs of the elderly consumer population and will benefit the development of appealing protein-enriched foods.

1.2. Current study

In this study, a market segmentation approach (Wedel & Kamakura, 1999) was adopted to explore heterogeneity among elderly in acceptance of various potential carriers for enrichment. A set of carriers was selected that varied systematically on three broad, underlying dimensions: healthiness (healthy vs. unhealthy), novelty (novel vs. traditional), and meal type (meal component vs. snack). These dimensions are relatively fundamental and objective, as they reflect ways in which foods are represented in the minds of consumers (Blake, Bisogni, Sobal, Devine, & Jastran, 2007; Furst, Connors, Bisogni, Sobal, & Falk, 1996; Ross & Murphy, 1999).

When studying heterogeneity among consumers in the functional food market, preferences and behaviour are argued to be a better starting point than perceptions such as appropriateness (for a review, see van der Zanden, van Kleef, de Wijk, & van Trijp, 2014a). Consumer perceptions are often similar (e.g., perceiving apples to be healthy) and product attributes that simply appeal to consumers often do not guide actual buying behaviour (e.g., wanting or buying apples) (Ajzen & Fishbein, 1980; Ulwick, 2002). In a natural setting, consumers first trial purchase a product and only repeat purchase it after a satisfying experience (Oliver, 1993). Therefore, this study segmented elderly consumers on their willingness to trial purchase various enriched foods. However, to increase protein intake among the elderly it is crucial that these consumers are not only curious about and willing to try protein-enriched foods, but that these products are also eventually incorporated into their daily diet. In addition, elderly consumers may only be willing to try protein-enriched foods they perceive to be appropriate. To obtain a more comprehensive picture of product acceptance, we explored the relationship between perceived appropriateness of protein-enriched foods, willingness to trial purchase protein-enriched foods and willingness to repeat purchase these products, using a mediation analysis.

2. Methodology

2.1. Participants

Participants were recruited among members of the online SenTo panel (Seniors of the Future; Kremer, 2012), which consists of 816 independently living adults between the ages of 55 and 92 years. All SenTo members were approached with the online survey and a total of 341 members (41.8%) responded. Respondents were 56–87 years old ($M = 67.0$, $SD = 6.1$) and the respondent sample consisted of 135 males (39.6%) and 206 females (60.4%). The sample was representative of the Dutch elderly population in terms of gender and marital status, but not in terms of age, health and living situation (CBS Statline, 2013). Respondents in our sample were still living independently and were, compared to the Dutch elderly population, relatively healthy and young. In addition, all respondents were internet users. Background characteristics were derived from the SenTo database.

2.2. Procedure

Respondents received an invitation by email to fill out the online survey. Upon following the link to the survey, respondents were presented with a short introduction to the study which contained a description of proteins (i.e., “proteins are nutrients that can be found in meat, dairy, nuts and legumes”) and enriched foods (i.e., “enriched food is food with added nutrients such as proteins”). This was done to make sure that all respondents had some basic knowledge on the concept of protein-enriched food. The introduction was followed by the carrier evaluation task, during which respondents were presented with 16 carriers in a random order and were asked to rate each of them on three scales: carrier appropriateness, willingness to trial purchase and willingness to repeat purchase. After completing the carrier evaluation task, respondents were presented with a short questionnaire that assessed what means they would prefer to use to increase their protein consumption, if necessary. This measure was added to identify possible reasons for rejection of enriched food. Nine checks of €25 – were raffled among respondents who completed the questionnaire.

2.3. Carriers

Carriers for the evaluation task were depicted on cards containing the name of a carrier type and a corresponding colour picture (Fig. 1). Carrier types were restricted to processed foods (i.e., excluding fresh products like vegetables) such that they would be realistic candidates for protein enrichment. Carriers varied systematically on three dimensions with two levels: healthiness (health vs. unhealthy), novelty (novel vs. traditional) and meal type (meal component vs. snack), resulting in ($2 \times 2 \times 2 =$) eight unique carrier formats (Table 1). A set of sixteen carriers was selected for the study, based on two exploratory and one confirmatory pilot study (see Appendix A). Each carrier format was represented by two carriers, to reduce the influence of unstudied characteristics of carriers (e.g., brand or taste) on evaluations of their overarching carrier format. Ratings of product acceptance of carriers within a pair were averaged such that they reflected their overarching product format rather than individual, underlying carriers. Ratings of product acceptance correlated significantly between carrier pairs at $p < .001$ and correlations were medium to high, ranging from .370 to .651.

Three analyses of variance (ANOVA's) were performed on the data that were gathered during the exploratory pilot studies to

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