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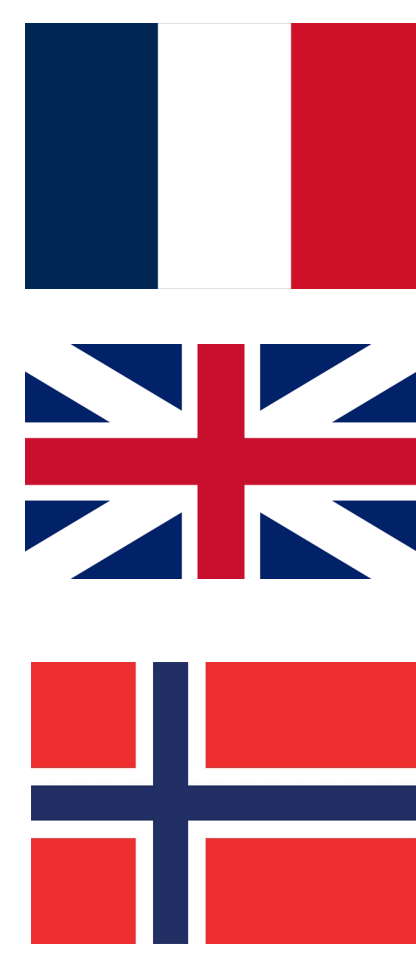
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European older adults' acceptability of and preferences for protein fortification

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BACKGROUND

- Protein consumption is vital in combating negative outcomes associated with malnutrition in older adults (e.g., sarcopenia, functional decline & reduced quality of life)
- Older adults require more protein per day than younger adults (1.2-1.5g/kg body weight/day)
- Poor appetite is a major determinant of protein-energy undernutrition
- Protein fortification of regular food or drinks provides a flexible & relevant approach for older adults with reduced appetite
- "Food has no nutritional value until it is chosen, accepted & consumed" (Forde et al, 2004), therefore novel at-home fortification methods must empower older adults to take a personalised approach to their nutrition & current diet, without requiring a large behavioural change

METHODS

Co-creation approach involving focus groups & home-use trial in France, UK and Norway.

1) Focus groups with adults aged 70+ (n=37) and carers (n=15)

- Discussed knowledge of and attitudes to protein and fortification.
- Using examples of high protein ingredients (ground almonds, whey protein powders, eggs, cream, cheese etc), participants asked to hypothetically fortify their meals from the previous day. They also discussed preferred meal carriers and ingredients.

2) Home-use trial of fortified recipes with adults aged 70+ (n=158)

- Participants received ingredients and instructions to make 8 protein-fortified recipes at home over 1 month: Porridge, Granola, Bolognese, Mashed Potatoes, Pancakes, French Toast, Carrot Soup, & Vanilla Cake.
- Recipes accompanied by a questionnaire to rate the ease of preparation and liking, and an end-of-study questionnaire was provided to capture overall opinions and preferences.

FOCUS GROUP RESULTS

Using multisite qualitative analysis (Jenkins et al, 2018) 12 subthemes were identified across countries: **Methods of food preparation, who does the cooking, taste and smell, health, natural ingredients, social factors, physiological considerations, beliefs, dissociation from age group, knowledge, everyday culinary ingredients & protein extracts.**

Notably, the language used by participants (aged 70+) revealed they did not see themselves as the target market.

"I do think that the age group you're aiming at are quite set in their ways and they are not always happy to change."

The importance of taste and enjoyment was highlighted.

"You get to seventy years old. You're not gonna start eating stuff that you don't like so it's gotta taste good."

Some were unfamiliar with protein extracts,

"I'd be really stuck to find out what to do with them"

but liked the idea of using them to substitute other dry ingredients to thicken up a soup or casserole.

"If it's adding the protein, that's a double winner."

HOME-USE TRIAL RESULTS

What are older adults perceptions of the high protein fortification ingredients? Mean (SD) and Median score (m) shown across all participants (n=154).

Overall (5-point scale)	Usage (4-point scale)	Taste (4-point scale)	Texture (4-point scale)	Nutrition (3-point scale)
I was happy with the outcome because it did not seem to change the meal ^a	Easy to use ^b	Did not change the taste of the food ^c	Did not change the texture of the food ^d	Improved the nutritional content of the food
Mean = 2.04 (.831) m = 2	Mean = 1.71 (.756) m = 2	Mean = 1.92 (.536) m = 2	Mean = 1.88 (.600) m = 2	Mean = 1.09 (.304) m = 1

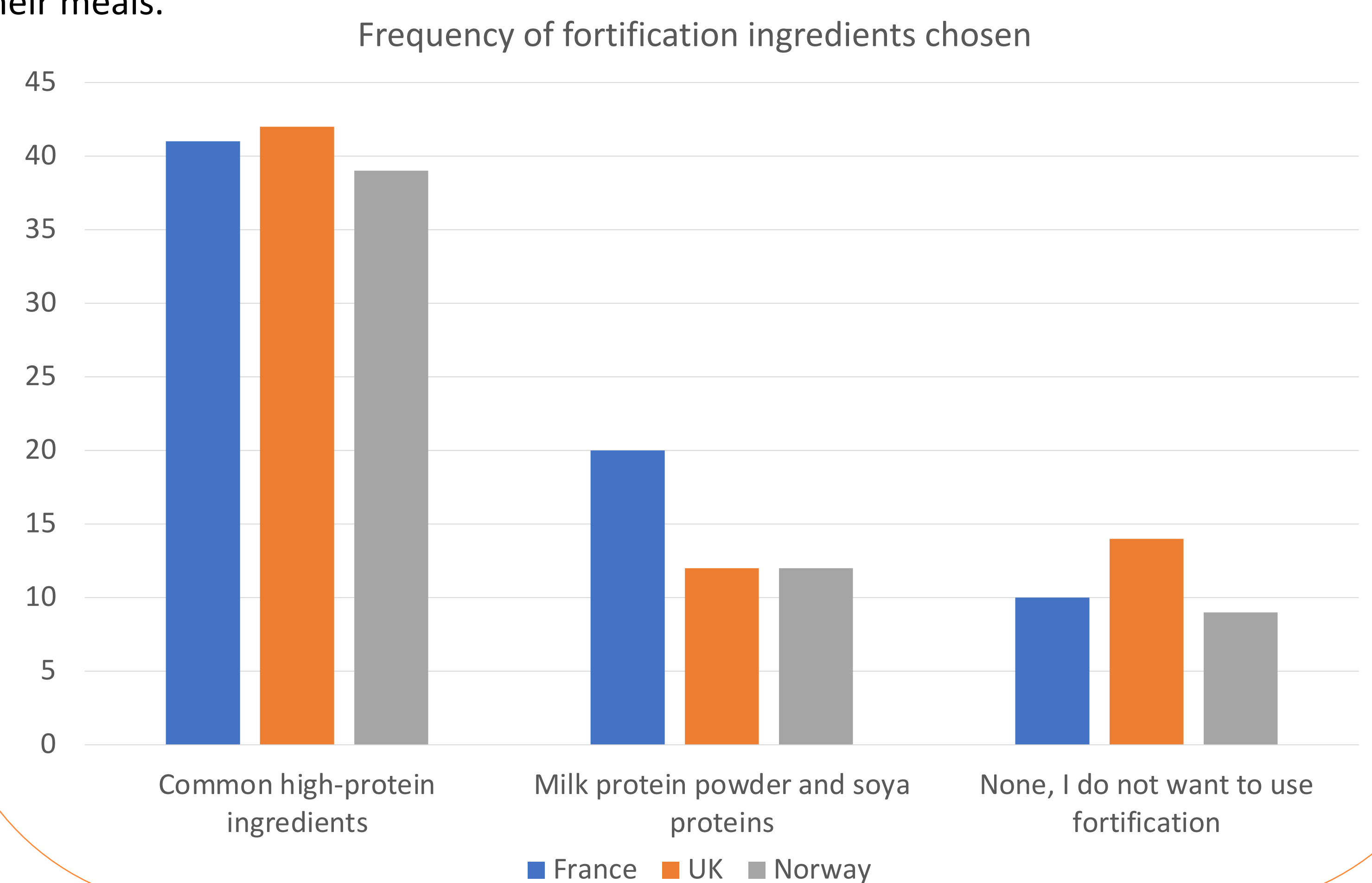
^aSig difference between gender, ^bsig difference between gender, ^csig difference between UK & Norway, ^dsig difference between France and UK

What fortified recipes and ingredients were most liked by older adults?

Country	Favourite recipe	Least favourite recipe
France	Carrot soup	Granola
UK	Granola	Mashed potato
Norway	Granola	Carrot soup

The preferences varied a lot across countries, though UK and Norway responded more similarly than France. There were no significant differences between genders or impact of food neophobia.

A check all that apply (CATA) question showed that older adults would prefer to use common high-protein ingredients (such as cheese, nuts, milk, almond flour...) to fortify their meals.



What is the likelihood of older adults continuing with fortification in the future?

Likelihood	% of older adults
Yes, most definitely (1)	11.1
Yes, probably (2)	37.9
No, probably not (3)	41.8
No, most definitely not (4)	9.2
Mean(SD)/Median	2.49 (.812)/m = 3

Most older adults did not intend to continue to fortify their own food at home.

CONCLUSION

- Focus groups findings indicated older adults think protein fortification is a good idea, but view it as something for people older than themselves. The home-use trials highlighted that the recipes were easy to use, did not impact the taste or texture in a negative way, and the improved nutrition was recognised.
- Co-creation provided strategies to work around the barriers to entry (limited knowledge on protein needs & unfamiliarity/scepticism to protein powders) and highlighted the need for education on nutrition in aging so older adults were more aware of their needs. Carers looking for success with fortification should try adding high protein culinary ingredients to batch made foods, like soy mince and quark; and try using protein powders as substitutes for dry ingredients like cornflower and flour.