

Protein for Life: Towards a Focused Dietary Framework for Healthy Ageing

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Background

- Project funded by the 'Priming Food Partnerships' initiative
- Sandpit Event, Bristol September 2016

Aims of the Sandpit:

- To foster partnerships in **pre-competitive research**, across the food chain and **between disciplines**
- To fund **innovative research** of relevance to the food industry and addressing a public health challenge
- To stimulate preliminary research to give support to further research investment

Project Team



Prof Emma Stevenson
Newcastle University



Prof Jeff Brunstrom
University of Bristol



Dr Bernard Corfe
University of Sheffield



Dr Alexandra Johnstone
University of Aberdeen



Dr Mark Green
University of Liverpool



Dr Liz Williams
University of Sheffield

Industry Stakeholders



The Public Health challenge



- There are now more people in the UK aged 60 and above than there are under 18.5
- The number of people aged 65+ is projected to rise by over **40 per cent** in the next 17 years to over 16 million.
- ‘Ageing well’ – is priority public health message (WHO)
- **Many adults fail to meet the RNI for protein**
 - Evidence indicates intake above the RNI could be beneficial for older adults
 - Failure to address this will have significant impact on public health

The Public Health challenge



Perspective: Protein Requirements and Optimal Intakes in Aging: Are We Ready to Recommend More Than the Recommended Daily Allowance?


Daniel A Traylor, Stefan HM Gorissen, and Stuart M Phillips

Exercise Metabolism Research Group, Department of Kinesiology, McMaster University, Hamilton, Ontario, Canada

ABSTRACT

The Dietary Reference Intakes set the protein RDA for persons > 19 y of age at $0.8 \text{ g protein} \cdot \text{kg body weight}^{-1} \cdot \text{d}^{-1}$. A growing body of evidence suggests, however, that the protein RDA may be inadequate for older individuals. The evidence for recommending a protein intake greater than the RDA comes from a variety of metabolic approaches. Methodologies centered on skeletal muscle are of paramount importance given the age-related decline in skeletal muscle mass and function (sarcopenia) and the degree to which dietary protein could mitigate these declines. In addition to evidence from short-term experimental trials, observational data show that higher protein intakes are associated with greater muscle mass and, more importantly, better muscle function with aging. **We are in dire need of more evidence from longer-term intervention trials showing the efficacy of protein intakes that are higher than the RDA in older persons to support skeletal muscle health.** We propose that it should be recommended that older individuals consume $\geq 1.2 \text{ g protein} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ and that there should be an emphasis on the intake of the amino acid leucine, which plays a central role in stimulating skeletal muscle anabolism. Critically, the often-cited potential negative effects of consuming higher protein intakes on renal and bone health are without a scientific foundation in humans. *Adv Nutr* 2018;9:171–182.

The Public Health challenge



Protein slows the decline of muscle mass and strength (sarcopenia) related to ageing

We are failing to meet the need for food products to support healthy ageing



One third of adults over 50 years consume less than protein intake recommendations



Protein 4 life is a collaborative grant between academia and the food industry to work towards food solutions



Protein For Life

OUR RESEARCH QUESTION IS: How do we maintain a healthy protein intake in an ageing population?

OUR AIM IS: To develop and to disseminate a set of design rules for formulation of palatable higher-protein foods.

Project Objectives



1. To develop a **multi-disciplinary evidence-base** around protein intake and decision making in older adults
2. To identify **design constraints** for academic and industry partners
3. To use outcomes from Objective 1 to yield a **set of design rules** for higher-protein products
4. To formulate and trial an exemplar product based on the design rules
5. To disseminate our findings to key stakeholders; to develop a more general roadmap to inform product development

Work Packages



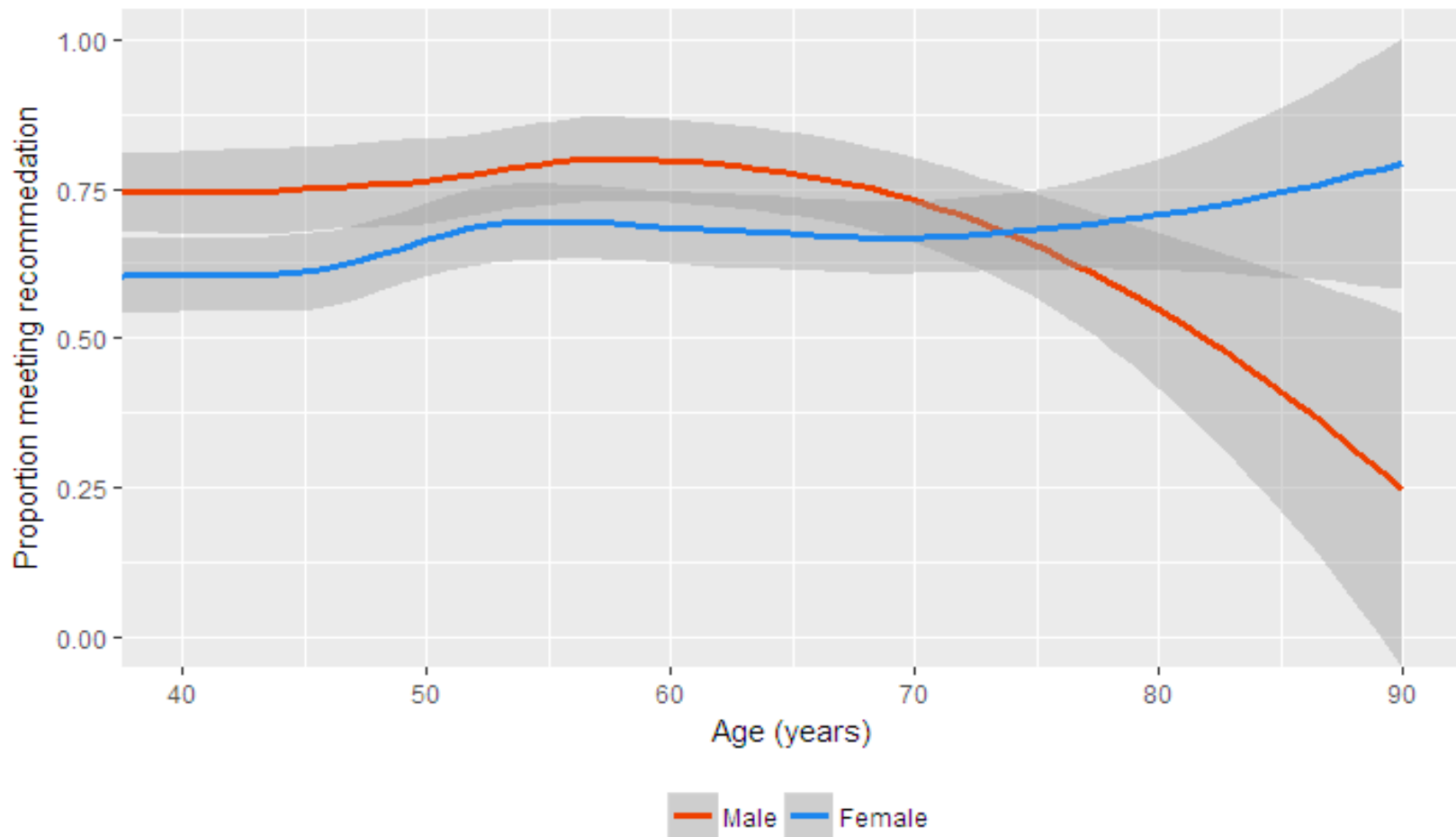
- **WP1** - Profiling of consumer behaviours for protein intake
- **WP2** - Focus groups and interviews on consumer barriers and opportunities for protein consumption
- **WP3** – Choice architecture
- **WP4** – Development of documentation on protein ingredient range with industry partners
- **WP5** – Development of a design brief
- **WP6** – Production of exemplar products and product assessment by consumers
- **WP7** – Communication brief and knowledge launch

WP1: Profiling of consumer behaviours for protein intake

Work Package 1



- Three different data sources used to develop a profile of the type, quantity, quality and timing of protein intake
 1. National Diet and Nutrition Survey (NDNS)
 2. Consumer Loyalty Data (from a leading super market)
 3. Food diary analysis from two projects from University of Sheffield
- **3 age groups** – 40-54 years, 55-69 years and 70+ years



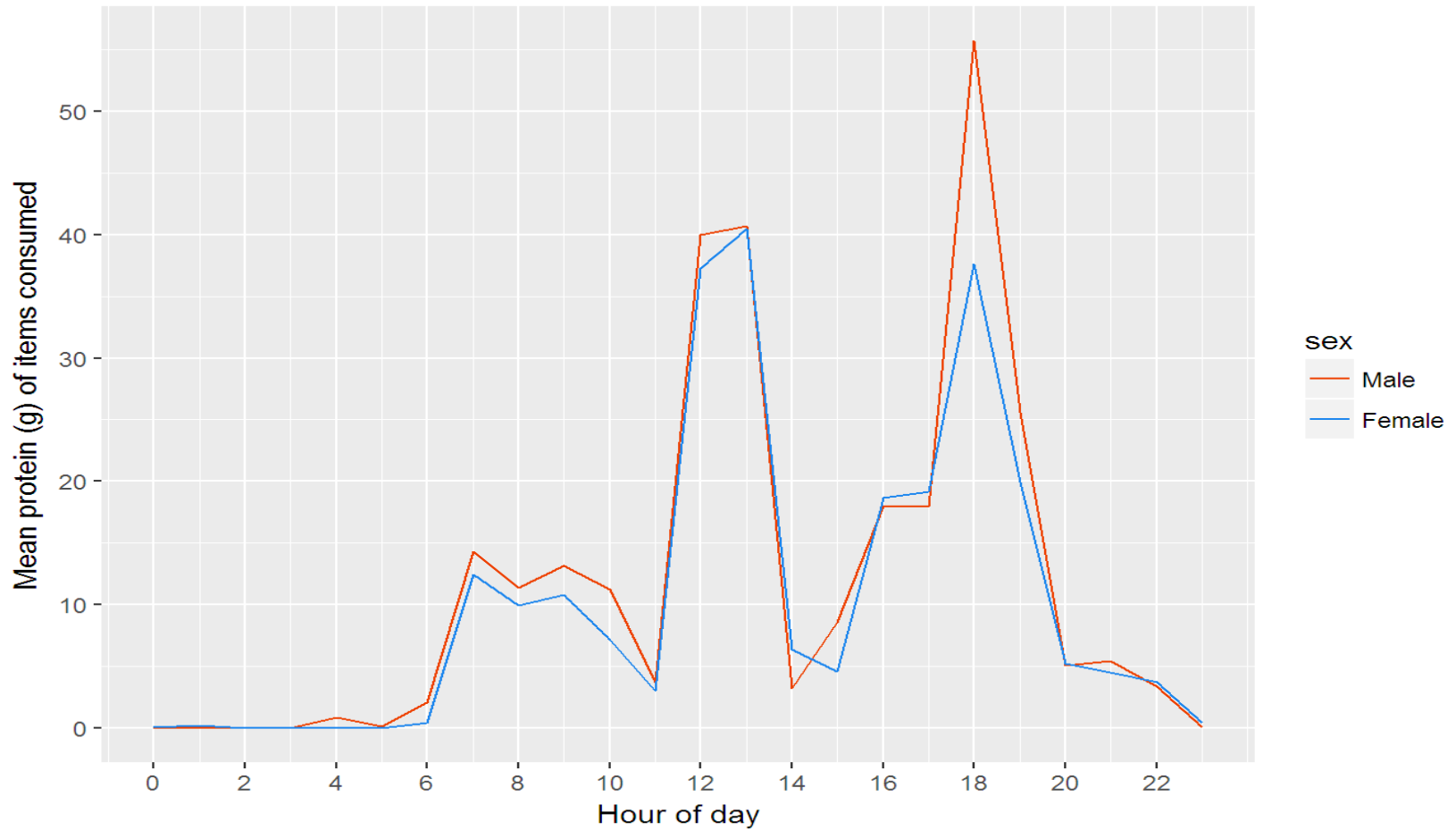
Proportion of individuals consuming 0.8 g of protein per kg BM by age and sex (Data: National Nutrition and Diet Survey, 2012-14).

Protein intake

- Proportion of adults consuming 1.2g protein /kg BM in the UK:

Age group (years)	Males	Females
40-54	24%	23%
55-69	26%	20%
70+	12%	20%

Protein distribution



WP2: Focus groups and interviews on consumer barriers and opportunities for protein consumption

Focus Groups

- 40 community-dwelling **healthy mid-life** (40-54 years), **young old** (55- 69 years) and **older old adults** (70+ years)
 - **product-based reasons** (e.g. appearance and taste)
 - **environmental-based reasons** (e.g. convenience and effort to cook)
 - **cognitive-based reasons** (e.g. nutritional knowledge and health beliefs)

Important information on psychological/ behavioural drivers for food choices and preferences

Key findings

- Poor understanding and awareness of the health benefits of protein
- The most important factors influencing purchasing of protein based foods are:
 - Taste and versatility
 - Healthiness of the food
 - Personal health complaints
- Over 60% of participants were not aware of recommended daily protein intake

WP3: Choice Architecture

Work Package 3

- **Choice Architecture** - A laboratory-based technique to quantify individual differences in 'preference for protein'
- A broader understanding of individual drivers of choice
- Information about how these 'food-choice architectures' change with age

Key findings

- The importance of perceived healthiness and perceived value of nutrients changes with increasing age
- In the 70+ group, participants were more likely to choose a higher protein food if it is also considered to be less filling
- Over 70's age category in particular may be unwilling to consume a product designed to increase their protein intake.

WP4:Development of documentation on protein ingredient range with industry partners

Work package 4



Deliverables

- Academic impact
- Accessibility
- Indicators
- Product



nutrients



18

1 *Review*

2 **Protein for Life: Review of optimal protein intake,**
3 **sustainable dietary sources and the effect on appetite**
4 **in ageing adults.**

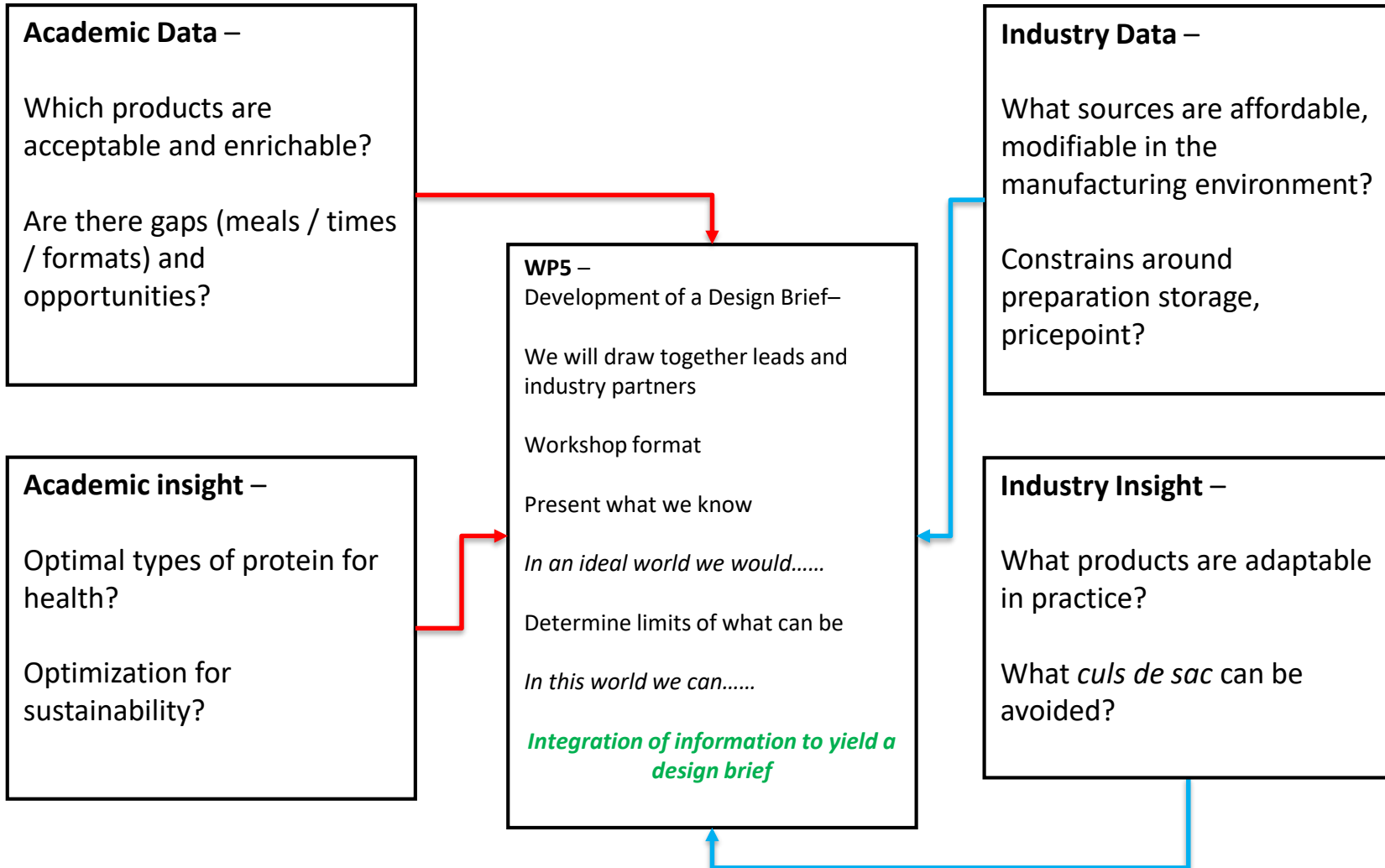
5 Marta Lonnie ¹, Emma Hooker ¹, Jeffrey M Brunstrom ², Bernard M Corfe ^{3,4}, Mark A Green ⁵,
6 Anthony Watson ⁶, Elizabeth A Williams ³, Emma Stevenson ⁶, Simon Penson ⁷, Alexandra M
7 Johnstone ^{1,*}

product.

Current work packages

- **WP5** – development of design brief
- **WP6** – exemplar product production led by Campden BRI followed by consumer product testing over 4 sites: Aberdeen, Newcastle, Sheffield and Bristol
- **WP7** – communication brief, tool kit and knowledge launch

WP5: Development of a design brief



WP6: Production of exemplar products and assessment by consumers

Exemplar product production

- Led by Campden BRI
- Involvement from all industry partners
- Biscuit product with two different amounts and two different types of protein



Exemplar product production

1. Animal based protein biscuit containing 13% of total energy as protein
2. Plant based protein biscuit containing 13% of total energy as protein
3. Animal based protein biscuit containing 22% of total energy as protein
4. Plant based protein biscuit containing 22% of total energy as protein
5. A generic taste matched wheat based biscuit (control)

Exemplar product production



18g, 40 Kcal and approximately 4.5g of protein each

Consumer Testing

- **Carried out at Aberdeen, Newcastle, Sheffield and Bristol**
- 50 participants in each age range (40-54 years, 55-69 years 70+years) across the sites.
- Participants will complete a sensory panel for each exemplar product in which the product will be assessed alongside a comparable, commercially available product
- Participants will be asked to rate a range of sensory responses including palatability, mouth feel, acceptability and expected satiety.

WP7: Communication brief and knowledge launch

Communication brief and toolkit



- The communication brief will be a written document summarising the findings from the study
- Toolkit for stakeholder agreement
 - video clips and social media content
 - Infographics
 - press-release statements
 - Powerpoint slides



Knowledge Launch

- Half-day event hosted at Campden BRI
- Project team will present the main findings of the research and also highlight the communication brief and toolkit
- Attendees will be encouraged to provide feedback on the study and engage in discussions on future collaborative opportunities.

DECEMBER 2018

Summary

- Protein intake in older adults needs to be addressed
- Complex set of barriers and opportunities
- Education on benefits of protein intake in ageing is key
- Several opportunities for NPD and reformulation
- Pump-priming study – only the beginning!

Any Questions?

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