EPSRC
Engineering and Physical Sciences Research Council

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bioscience for the future

Protein 4 LifE

Development of high protein products for healthy ageing

A Priming Food Partnerships Initiative

MRC Medical Research Council

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Project background & aims

Newcastle University

University of Aberdeen

University of Bristol

The University Of Sheffield.

University of Liverpool

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

Bradgate Bakery

Mondelēz International

Nestlé

pladis

Premier Foods

Sainsbury's

Campden BRI
food and drink innovation

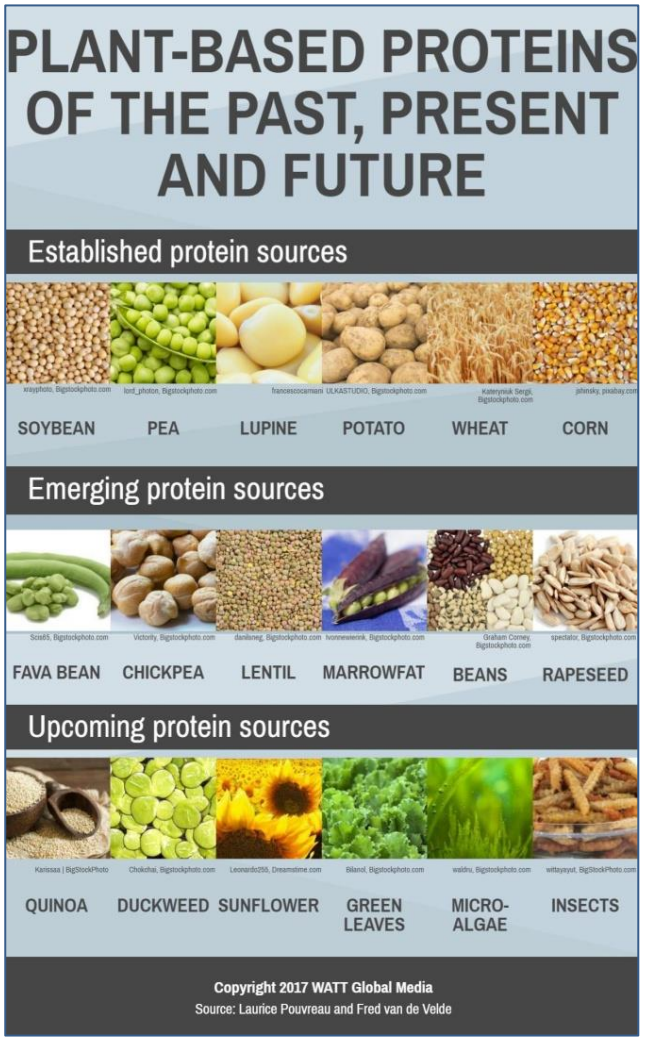
Protein slows the decline of muscle mass and strength (sarcopenia) related to ageing

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

Product Design Rules for Consideration

25-30g protein per eating occasion (breakfast, lunch, dinner or snack) is required to illicit muscle protein synthesis and prevent muscle loss



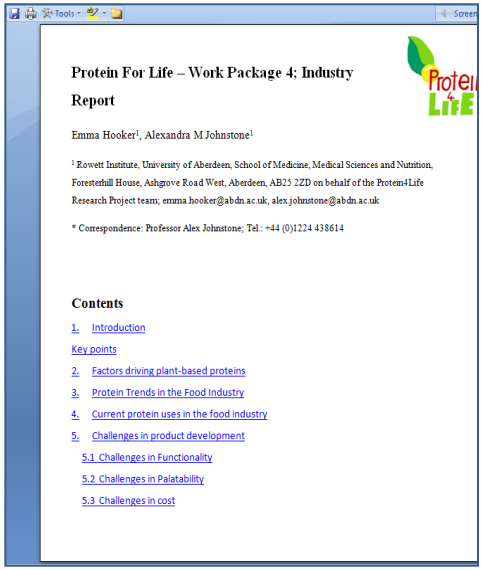
Protein source must be **sustainable**; *plant proteins* have lower environmental impact and fewer negative health associations compared with animal proteins

Protein source must be **high quality**; ideally contain all the essential amino acids, and have high digestibility and bio-availability when eaten

The final product must be **acceptable to the consumer**; tasty, visually appealing, and affordable

Industry insights

- A report was commissioned to discuss the insights and ideas generated from discussion with industry partners
- Current food industry trends including Sustainability, Healthy Eating, and Clean Eating suggest there is scope for plant-based high-protein products for healthy ageing
- Plant proteins contain less protein per gram compared to animal proteins, and plant protein quality, palatability, availability, and cost (particularly for novel proteins) can present additional challenges
- Adding high amounts of protein can alter the final taste and texture of a product; knowledge of the physico-chemical properties of a protein ingredient (e.g. its solubility, viscosity, gelation, hydrophobicity, water-binding and emulsifying properties) can aid product developers



Protein For Life – Work Package 4; Industry Report

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Advances in protein fractions (concentrates, isolates, hydrolates) can provide numerous formulation solutions however fractions may not be suitable ingredients for certain product categories including short shelf-life chilled ‘to-go’ foods/fresh prepared meals, and products marketed as ‘natural’ and unprocessed

Identified challenges and opportunities

- **Cost** is the main limiting factor for product development and is significantly impacted by raw ingredient cost and ingredient functionality
- A **reliable and scalable supply chain** for raw protein ingredients is essential
- The industry perceives **protein quantity to be of greater value** than protein quality for the consumer, due to lack of consumer awareness about the role of protein in age-related muscle loss
- **Lack of consumer awareness** is currently a significant barrier to the development of age-related high protein products; the industry would welcome a greater input from public health bodies to create a clear and concise health message for consumers
- Industry voiced concern that **consumer acceptance** of 'functional' protein products may hinder product success; to increase consumer acceptance, further research into consumer attitudes and behaviours will help develop an effective marketing approach for age-related high-protein products
- **Labelling requirements** for protein claims could be improved to reflect the needs of older adults; age-specific nutrition claims will aid product marketing
- The industry is proactive, well equipped, and will be highly successful at overcoming the recognised and emerging formulation challenges specific to plant-based protein ingredients

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