Loss of appetite in older adults - comparing food first and oral nutritional supplements to prevent and treat malnutrition

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UNIVERSITY OF LEEDS

Background

- Interest in anorexia of ageing
- Tackling malnutrition in older adults
- Food first and oral nutritional supplements
- Loss of appetite and how to identify this

Real world problem

- Approached by Professor Marion McMurdo, Ageing and Health Clinical Lead at University of Dundee in 1998
- Hospital settings where undernutrition and unintended weight loss were common
- Nutritional approaches such as sip-feeds were not successful in clinical care context

thebmj

BMJ 2017;357:j1148 doi: 10.1136/bmj.j1148 (Published 2017 April 05)

OBSERVATIONS

BMJ CONFIDENTIAL

Marion McMurdo: Love later life—and chips

British Medical Journal Publishing Group BMJ
2017;357:bmj.j1148

British Journal of Health Psychology
the british psychological society

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Pages 57-66

Nutritional supplementation in older adults: Pleasantness, preference and selection of sip-feeds

S. J. McAlpine, J. Harper, M. E. T. McMurdo, C. Bolton-Smith, M. M. Hetherington

Proceedings of the Nutrition Society (1998), 57, 625–631

Taste and appetite regulation in the elderly

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Scott Med J. 2001 Dec;46(6):171-2. doi: 10.1177/003693300104600606.

Preferences for different high-energy foods in elderly medical in-patients

J R Harper [1], S McAlpine, M M Hetherington, C Bolton-Smith, M E McMurdo

Clinical Nutrition 29 (2010) 160–169
Contents lists available at ScienceDirect
Clinical Nutrition
journal homepage: http://www.elsevier.com/locate/clnu

Review

Older adults and patients in need of nutritional support: Review of current treatment options and factors influencing nutritional intake

Willem F. Nieuwenhuizen [a,*], Hugo Weenen [a], Paul Rigby [b], Marion M. Hetherington [c]
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ELSEVIER
Appetite 43 (2004) 269–276
Appetite
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Research Report

Old and alone: barriers to healthy eating in older men living on their own

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Received 10 December 2003; revised 29 March 2004; accepted 11 June 2004

Background (1998-2009)

Study 1 Poor adherence – are ONS disliked?

0036-9330/01/03001/171
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Scot Med J 2001; 46: 171-172

PREFERENCES FOR DIFFERENT HIGH-ENERGY FOODS IN ELDERLY MEDICAL IN-PATIENTS

J.R. Harper, S. McAlpine, M.M. Hetherington*, C. Bolton-Smith+, M.E.T. McMurdo*

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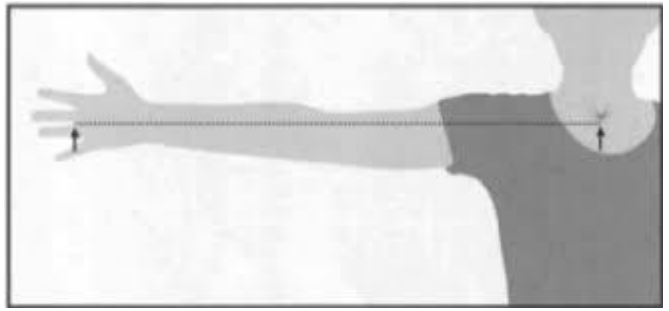
* Department of Psychology, University of Dundee;
+ Cardiovascular Epidemiology Unit, Ninewells Hospital and Medical School Dundee.

Abstract: *Malnourishment is a common finding in hospitalised elderly patients. It is often addressed by the provision of nutritional supplements, in the form of sip-feeds. Patients' intake of these is frequently inadequate. We assessed the palatability of sip-feed nutritional supplements and other high-energy foods to elderly medical in-patients. Using the Lickhert Scale, 49 subjects rated the taste of a previously selected sip-feed supplement and five other high-energy foods, cheese biscuit, plain potato crisps, chocolate, cherry-flavoured cereal bar and stout beer. Subjects rated the taste of sip-feeds as favourably as all other offered foods, with the exception of the lower rated stout beer (p=0.0001). Taste alone is unlikely to account for the poor intake of sip-feed nutritional supplements by elderly hospital patients.*



- N = 55 patients from medical assessment and rehabilitation wards recruited
- N = 52 aged 65+yr, agreed to participate, data usable n = 49 (33 females, 16 males)
- Nutritional status assessed by BMI, demi-span, unintended weight loss (significant malnutrition)
- Selected their favourite ONS flavour from 6 tasted samples (**vanilla, chocolate, strawberry, apple, orange, fruit punch**)
- Then tasted and rated this against 5 other items (cheese cracker, crisps, chocolate, cereal bar, Guinness)

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N = 49 participants

Study 1- ONS well liked but confounded by familiarity?

The favourite flavour of ONS compared well with other energy dense foods (not Guinness)

Offer favourite flavour and vary this over time (format and flavour)

However, in malnourished patients, ONS may already be familiar

Need to replicate in a healthy weight, healthy older adult sample

Study 2 – Poor adherence are ONS disliked?

British Journal of Health Psychology
the british psychological society

Nutritional supplementation in older adults: Pleasantness, preference and selection of sip-feeds

S. J. McAlpine, J. Harper, M. E. T. McMurdo, C. Bolton-Smith, M. M. Hetherington

- N = 21 adults aged 60 - 79 yr ($\bar{x}$ = 68 ± 1 yr) recruited
- Healthy weight range** – 2 men ($\bar{x}$ = 25.5 kg/m^2) and 19 women ($\bar{x}$ = 27.3 kg/m^2)
- Unfamiliar with ONS (juice and milkshake formats)
- Familiar with high energy density alternatives

** Sorkin, Mueller, Andres (1999) **Baltimore Longitudinal Study of Aging**

Study 2 – Poor adherence are ONS disliked?

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Nutritional supplementation in older adults: Pleasantness, preference and selection of sip-feeds

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Table 1. Weights and nutritional profiles for foods offered in the snack tray

Foods	kcal per 100 g	Protein	Fat	Carbohydrate
45 g cheese sandwich crackers (Ritz)	504	8.9	29.2	51.4
50 g regular Pringles™ (Proctor & Gamble)	530	4.5	36.0	47.0
37 g Nutrigrain™ cereal bar (Kellogg's)	350	4.0	8.0	68.0
30 g chocolate buttons (Cadbury)	525	7.8	29.4	56.8

Drinks	kcal per 100 ml	Protein	Fat	Carbohydrate	Alcohol
240 ml Enlive™ (Ross Products)	125	4.0	27.3	0.0	0
200 ml Ensure Plus™ (Ross Products)	150	6.3	20.2	4.0	0
440 ml beer (Guinness)	145	0.4	0.1	2.8	3.1

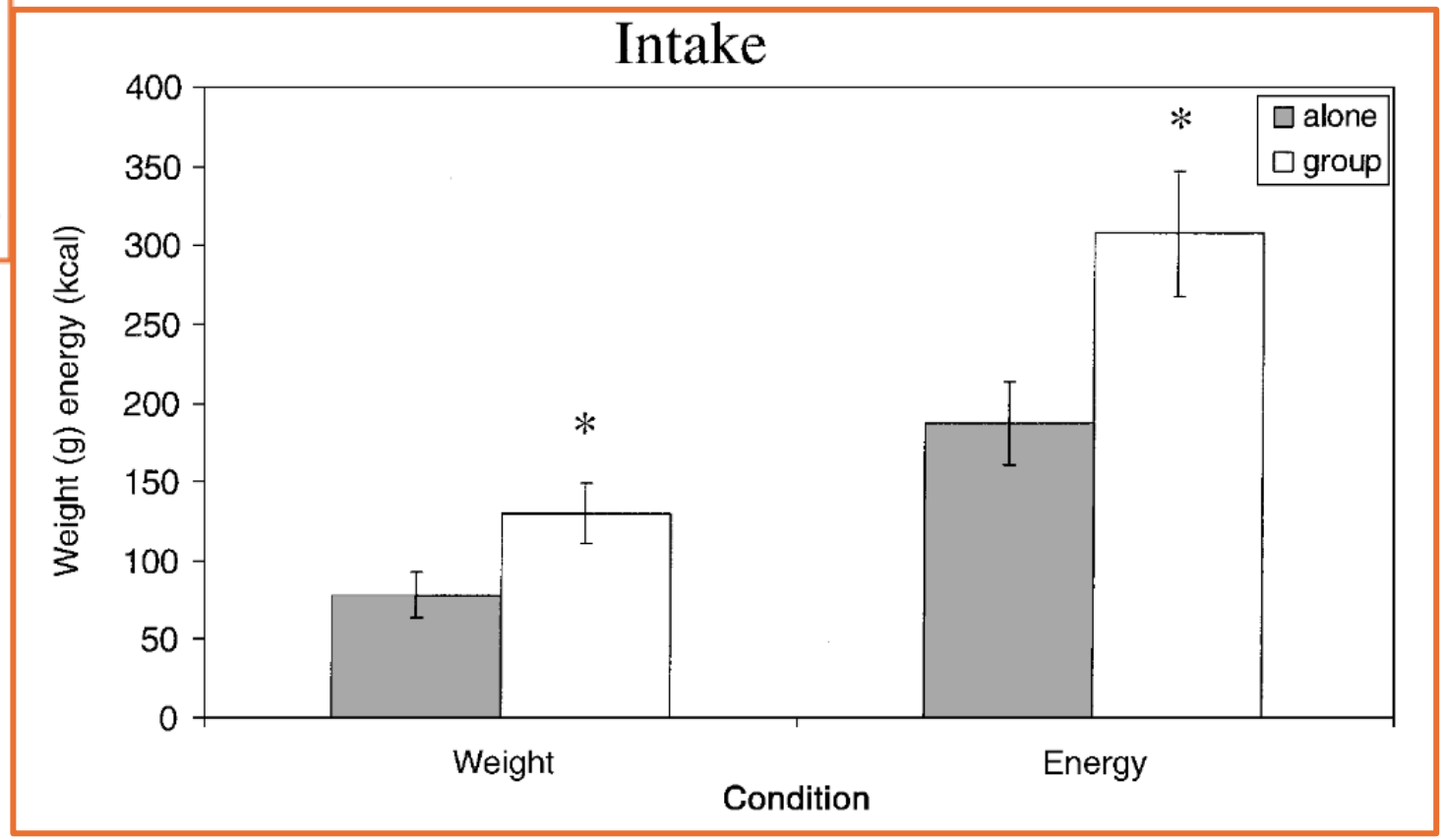
Three fruit juice flavours (apple, orange, fruit punch)

Three milkshake flavours (vanilla, strawberry, chocolate)

Study 2 – Poor adherence are ONS disliked?

Table 2. Mean (SEM) energy intake of individual food items during both alone and group conditions

Food type	Alone (kcal)	Group (kcal)
Cheese cracker	47·4 ± 8·4	67·3 ± 11·5
Sip-feed	56·2 ± 19·2	81·4 ± 21·7
Pringles	34·0 ± 6·9	71·7 ± 11·4
Cereal bar	22·0 ± 10·2	23·8 ± 11·8
Chocolate	7·7 ± 2·5	13·4 ± 3·9
Beer	24·1 ± 13·6	50·3 ± 20·4



Study 2- ONS well liked even if unfamiliar

The favourite flavour of ONS compared well with other energy dense foods (not Guinness)

ONS was selected as part of the snack

Intake was facilitated by presence of familiar others (social eating)

Factors leading to malnutrition

Social changes

Living alone, Eating alone

Less money, Reliance on others

Physiological Changes

Loss of taste/smell; Poor dentition/ mastication

Dry mouth

GI – impaired gut function, slower emptying

Hunger and thirst impaired

Greater satiation, sensitivity to CCK

Psychological Changes

- Depression
- Dementia
- Loss of interest in food

Eating

- Slower
- Less snacking
- Less dietary variety

Decreased food intake

Malnutrition

Clinical Nutrition 29 (2010) 160–169

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Older adults and patients in need of nutritional support: Review of current treatment options and factors influencing nutritional intake

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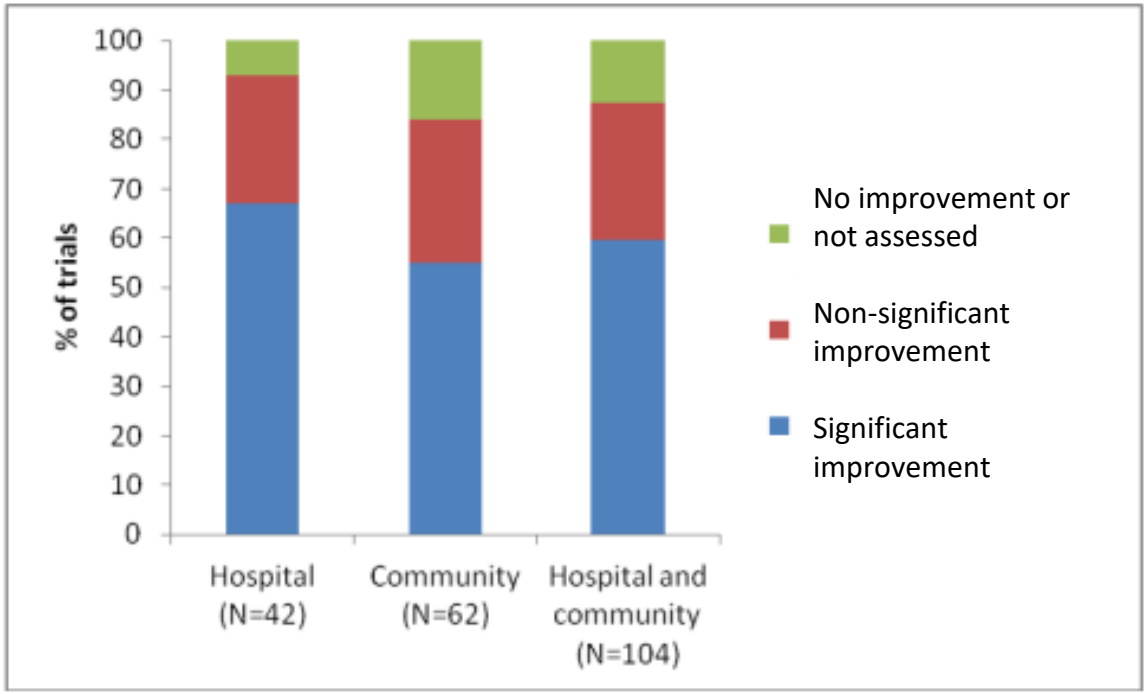
Malnutrition Task Force

Eating and drinking well in later life

Benefits of oral nutritional supplements

- Significant improvement in hospital settings
- But **adherence** varies by setting (hospital vs community) and by method (RCT vs survey)



Stratton R J, Green C J, Elia M (2003) Disease-related malnutrition. An evidence-based approach to treatment, UK. Oxford: CABI publishing.

SPOONful: can a Structured Prescription Of ONS improve adherence?

- Imprecise prescription of ONS contributes to low **adherence**
- Increased adherence through 'piggybacking' on existing habits? e.g. meal patterns
- Will a more **S**tructured **P**rescription **O**f **O**ral **N**utritional supplementation improve adherence?
- Step 1 – focus groups with healthy older adults
- Step 2 – prescribed structure with meals

Biotechnology and Biological Sciences Research Council
Medical Research Council
Food4Years Ageing Network
UNIVERSITY OF LEEDS
Aston University BIRMINGHAM UK
Loughborough University

Adherence to ONS

- Eighteen healthy older adults (13F; mean age = 73.4 yr; range: 70-80 years) participated in focus groups
- Exploration of taking prescribed medications, ONS adherence considerations for trial development, and any improvements to products.
- Focus groups were audio recorded in person and video recorded for the online group, then transcribed
- Qualitative data were then analysed using Reflexive Thematic Analysis (RTA) as described by Braun and Clarke (2006*, 2019); using an inductive, ‘data-driven’ approach to generate open codes rather than testing an existing conceptual framework

*(*Cited by >200,000 papers - 3rd most-cited scientific paper of the 21st century)*

Participants

- 4 focus groups (three in-person and one online)
- 5/18 had direct prior experience of ONS
- 6/18 indirect experience (providing for others)
- 6/18 had no experience but were familiar with ONS
- 1/18 had both direct and indirect experience

Session #	Pseudonym	Age	Gender	Ethnicity	BMI	Experience of ONS
1	Walter	72	Male	White British	31.6	1*
1	Maria	74	Female	White British	25.6	2
1	Doris	76	Female	White British	31.0	2
2	Miriam	75	Female	White British	23.4	2
2	Conor	73	Male	White British	22.7	1*
2	Charles	80	Male	White British	23.8	1*
2	Lesley	77	Female	White British	18.7	3
2	Morven	73	Female	White British	21.00	3
3	Tom	72	Male	White British	26.4	3
3	Ashley	71	Female	White British	40.0	3
3	Joan	71	Female	White British	22.7	1 and 2
3	Caroline	71	Female	White British	33.1	2
3	Maurice	75	Male	White British	24.7	1
3	Patsy	72	Female	White British	22.7	2
4	Carys	71	Female	White British	22.3	1
4	Sandra	74	Female	White British	32.4	3
4	Kathy	74	Female	White British	25.3	3
4	Janice	70	Female	White British	24.0	2

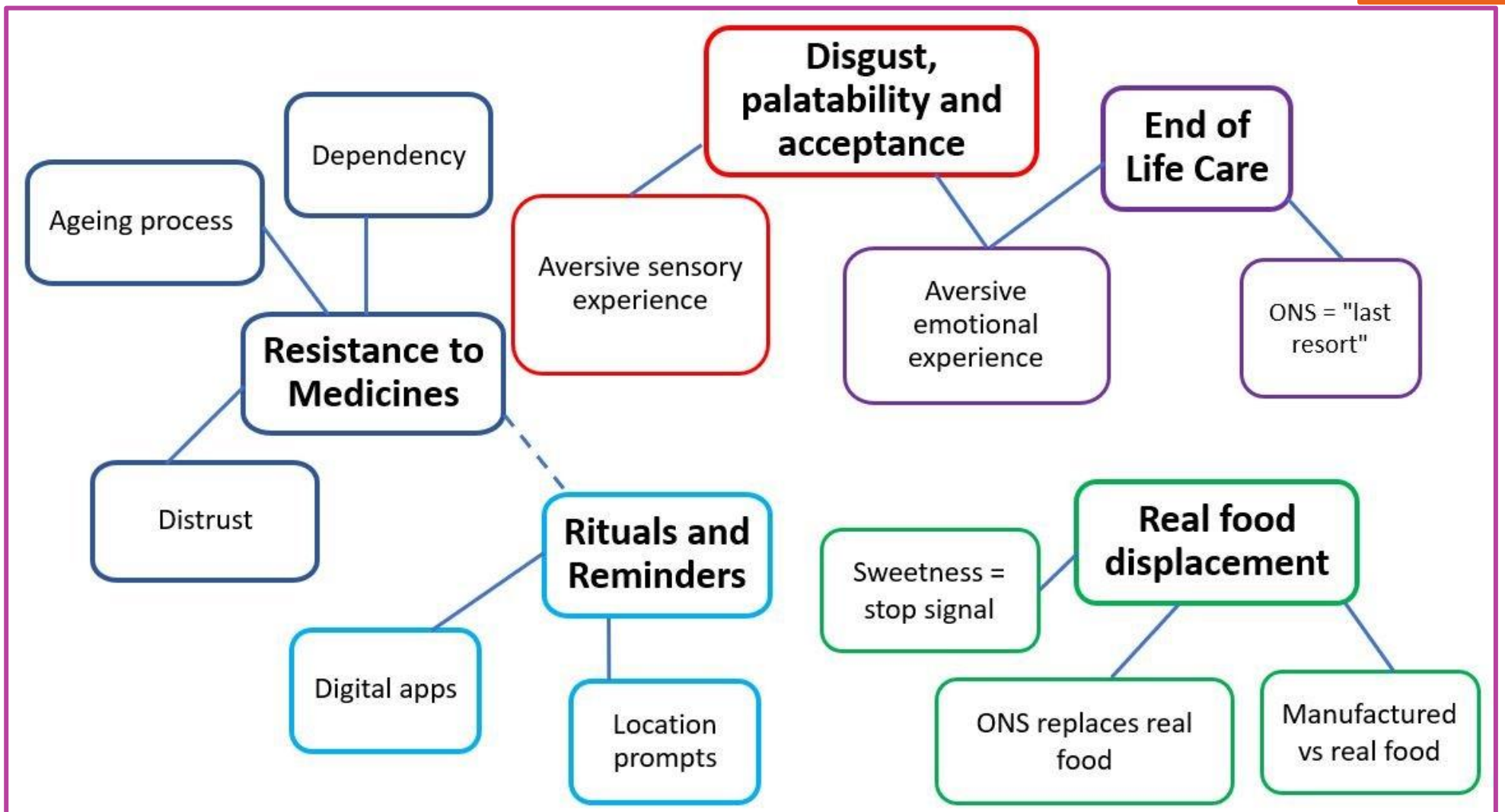
1 – indicates direct past experience of taking ONS during illness or 1* as a protein shake, vitamin supplement or meal replacement, 2 – indicates indirect past experience of providing ONS to others and 3 – indicates familiarity but no experience of taking or giving ONS).

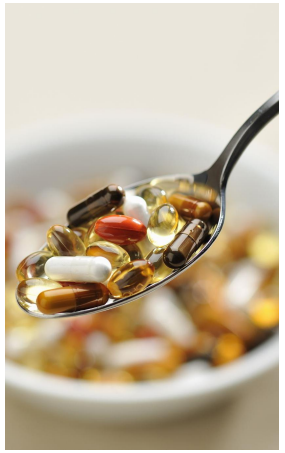
Thematic analysis - results

Appetite
Volume 197, 1 June 2024, 107327

"*I see it very much as an end-of-life food*" – Barriers to oral nutritional supplement adherence, views from healthy older adults

Marion M. Hetherington [a], Jason M. Thomas [b], Chris J. McLeod [c]





Resistance to Medicines; Rituals and Routines; Replacing "real food“

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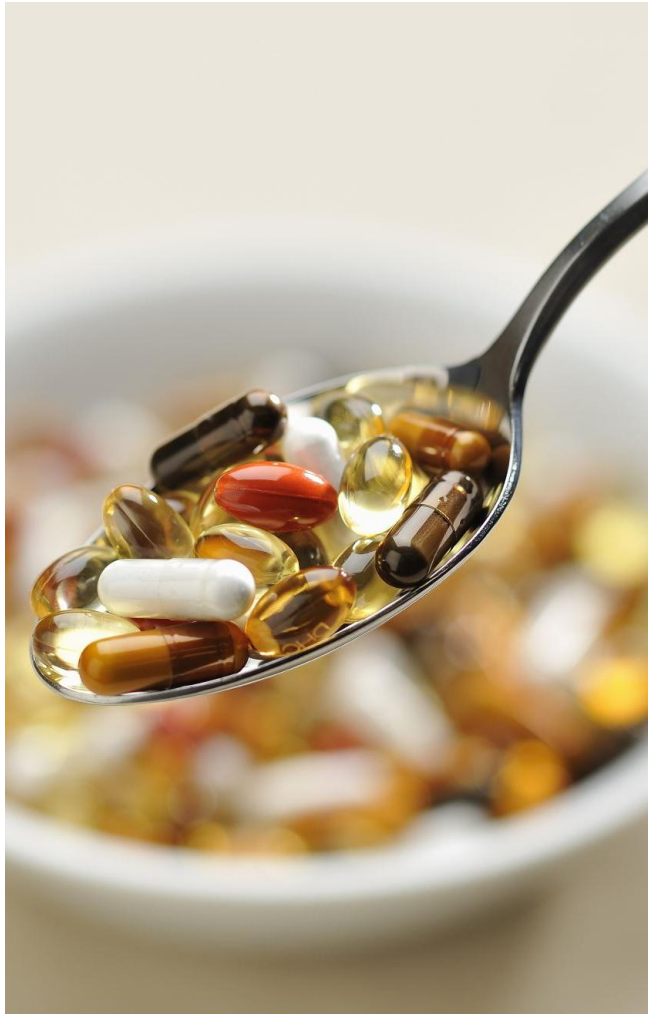

- "I don't like taking medicine. **I only take what I absolutely have to”**
- ".. I find it's getting **into the routine**. So, the morning ones are next to the kettle yes, and the evening ones are next to the toothpaste"
- "I think there’s **a danger that it could be perceived as an alternative” (to real food)**

Adherence to ONS

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- Underlying resistance to medicines
- If ONS are viewed as medicines, this is a **challenge**
- If ONS are treated as a food, concerns about **displacing** "real" foods
- ONS may be associated with **aversive** experiences ("last resort")
- ONS occupy a **liminal space** between medicine and food
- Is "resistance" to taking ONS a cohort effect?

Malnutrition Task Force
Eating and drinking well in later life

Image from Malnutrition Task Force

Understanding “resistance” to ONS

Online quantitative survey with 447 adults age range from 18 to 87yr

Investigated familiarity with ONS and food fortification methods

Explored associations with each method based on qualitative data

Compared older and younger adults’ willingness to consume ONS, use FF for themselves and others

Invited responses to open-ended questions about use of ONS or FF and willingness to consume these

Participants

N = 502 participants recruited via Prolific
with Exclusion criteria:

- Already being prescribed ONS
- Diabetes
- Food allergies, intolerances
- Current/past history of eating disorders

N= 447 usable data

Comparison with UK Census (2021) data

- **Older** than population average
- **Higher education** level
- Similar gender, ethnicity, household income and residence to UK population

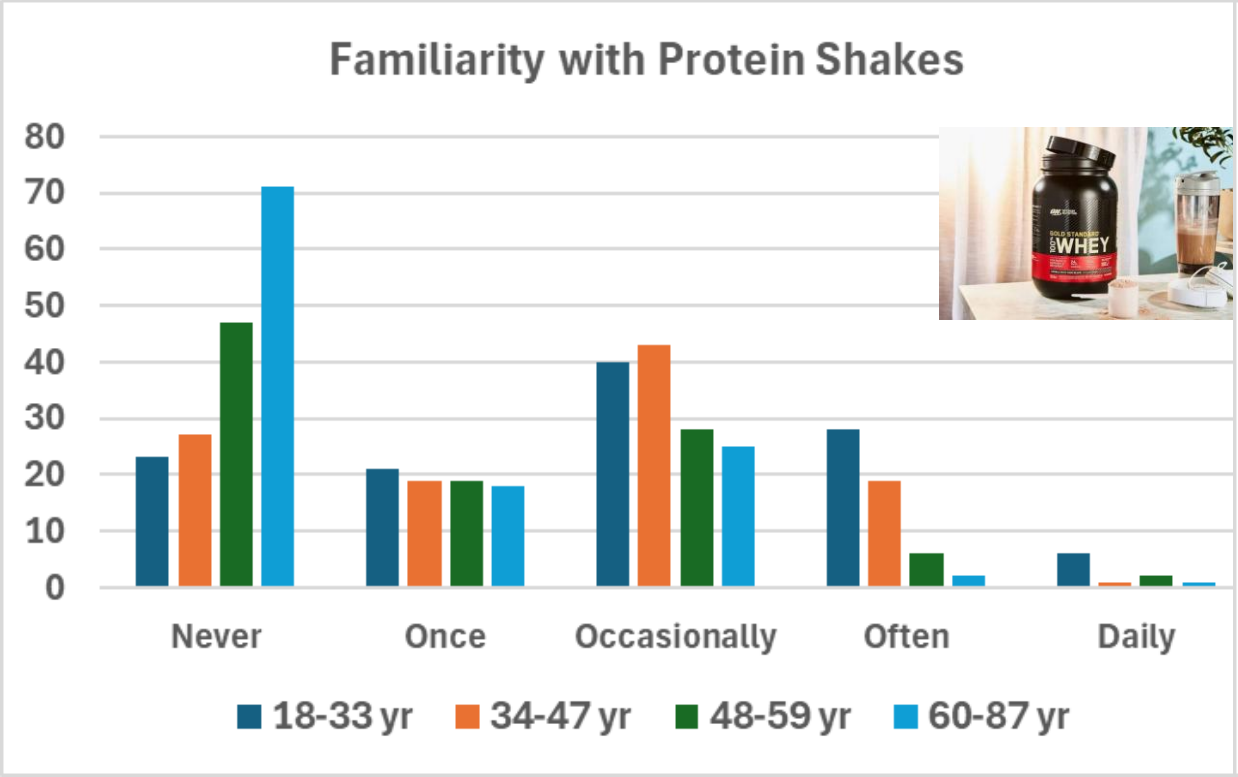
Table 1	
Age (years) Mean (SD, range)	46.7 ± 16 (18 – 87)
Age Groups	118 Group 1 (18 – 33 yr) 109 Group 2 (34 – 47 yr) 102 Group 3 (48 – 59 yr) 117 Group 4 (60 – 87 yr)
Gender distribution	217 M (48.5%) 227 F (50.8 %) 3 other (0.7%)
Ethnicity	380 white (85%) 34 Asian (8%) 17 Black (4%) 5 Arab (1%)
Education level	7 (2%) Some secondary 85 (19%) Completed secondary 80 (18%) Vocational training 42 (9%) Some University, no degree 156 (35%) University Bachelor's degree 77 (17%) Graduate or Professional degree
Household income	65 (14%) less than £20k 159 (36%) £20k – 39,999 100 (22%) £40k – 59,999 99 (22%) £60k – 99,999 22 (5%) >100k

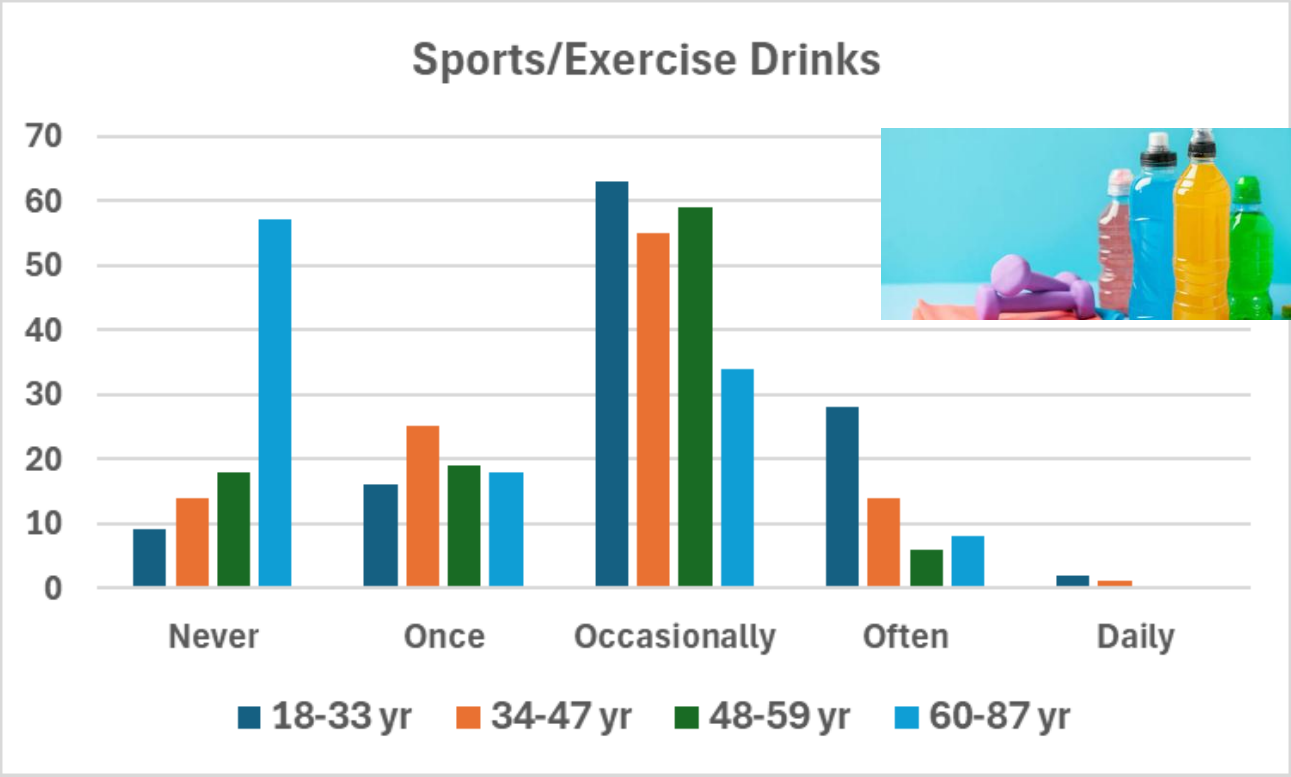
Methods

- Participant information, written informed consent (Ethics approval Loughborough 13002-13535;)
- Demographic information (including dietary patterns)
- Attention checks plus response times (timed out or too quick)
- Food Neophobia Scale (Pliner, 1992)
- Food Choice Questionnaire (Steptoe et al., 1995)

- **Familiarity** with forms of supplementation and fortification
- **Willingness** to consume ONS or to use FF for self to prevent or to treat malnutrition
- **Willingness** to recommend ONS or FF to others to prevent or to treat malnutrition
- **Associations** with ONS vs FF
- **Preference** to take ONS at prescribed times of day or not
- **Preference** to fortify foods within main meals or to take as snacks

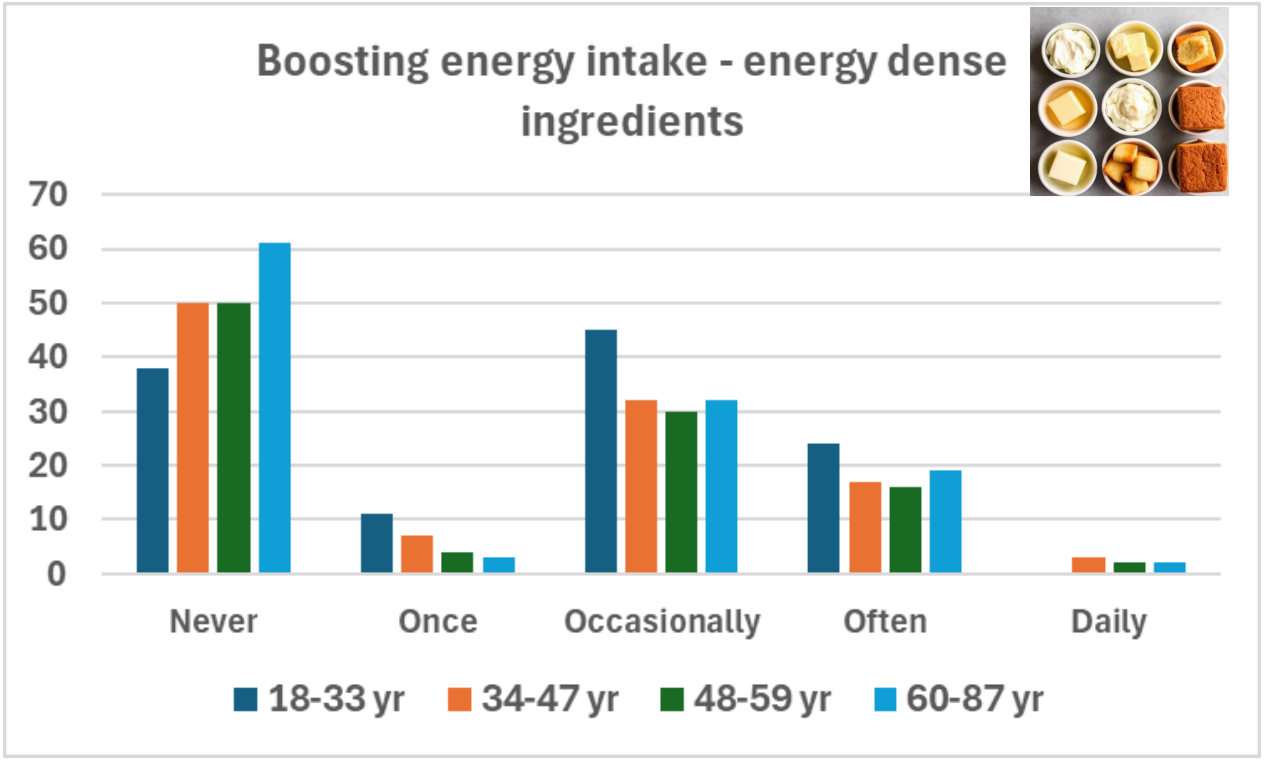
Familiarity with supplements and fortified foods/drinks

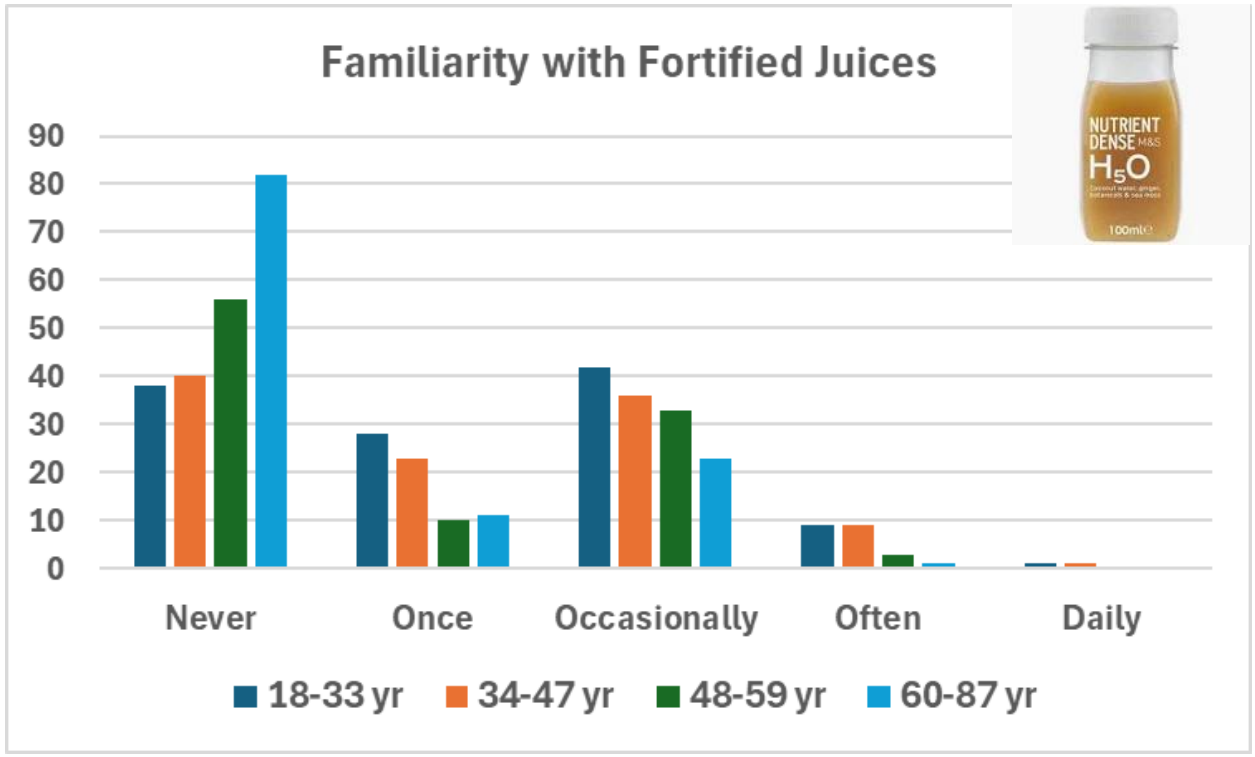




Hetherington *et al* (in preparation)

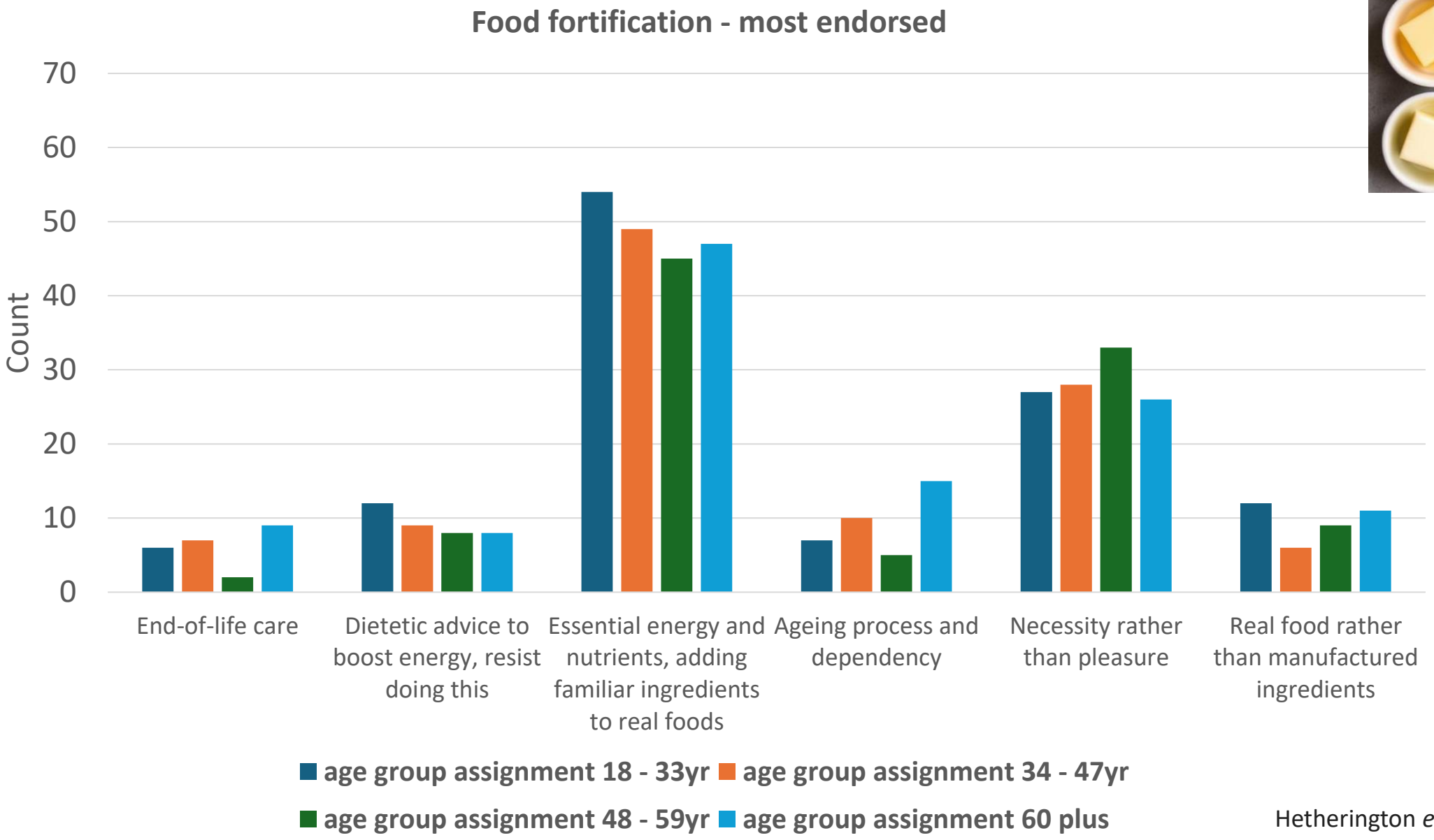
Food enrichment and fortified drinks





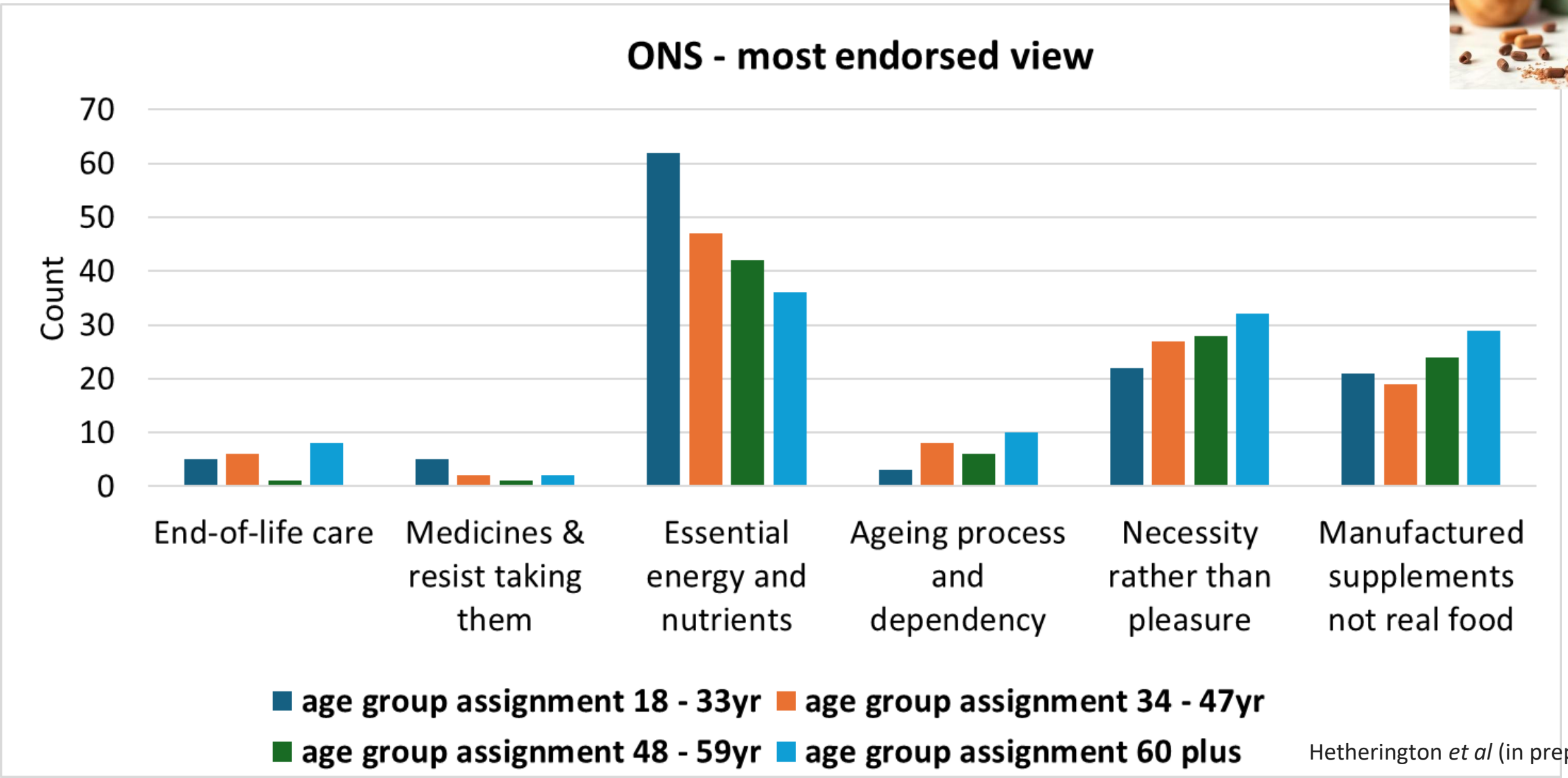
Hetherington *et al* (in preparation)

Views on food fortification



Hetherington *et al* (in preparation)

Views on ONS



Hetherington *et al* (in preparation)

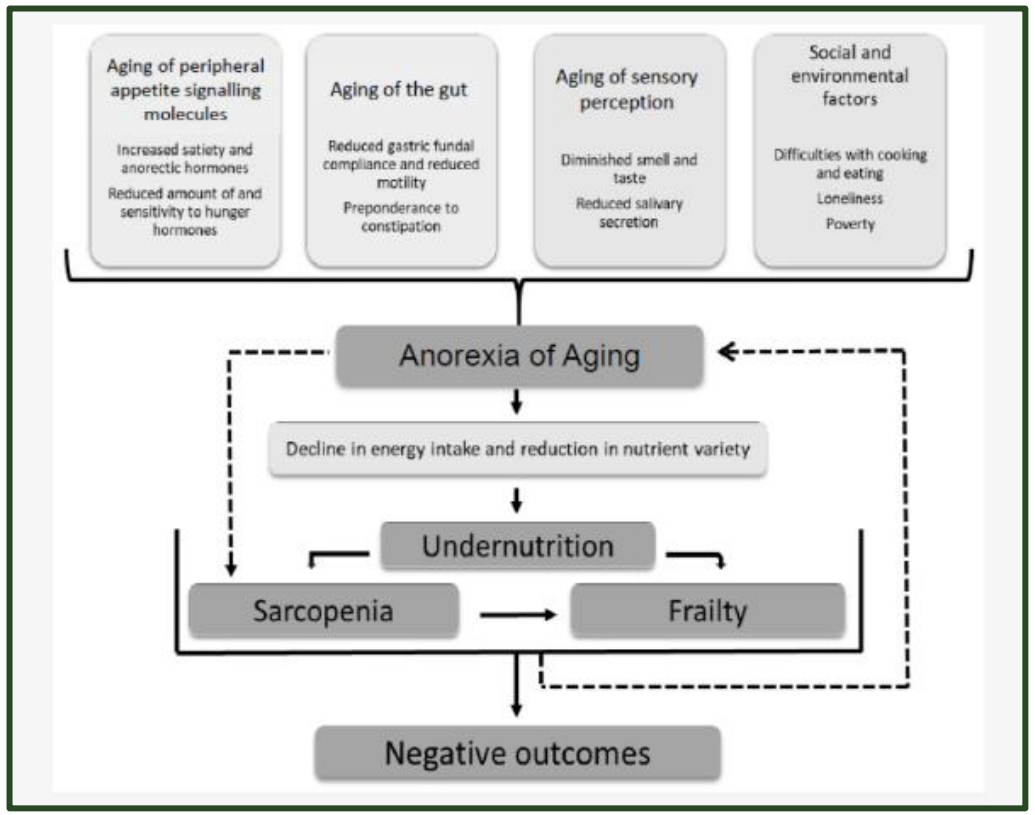
Preliminary conclusions – Quantitative Study

Younger adults are more familiar with nutritional supplements, and are more willing to take ONS to prevent malnutrition than older adults

Both younger and older adults were willing to take ONS to treat malnutrition

ONS and food enrichment were both viewed as providing essential energy and nutrition to those in need, but this view was endorsed more favourably in younger adults.

Loss of Appetite – proposed as a geriatric syndrome by Cox et al (2025)



Conclusions

- Young adults are familiar with using nutritional supplements, so this may be less challenging as a prevention measure – *but these are seen as "ultra-processed" (category 4, Nova)*

- Older adults are less familiar with using supplements, so favour food enrichment approaches but this is only practical ***if appetite is good***

- Prevention of malnutrition – focus on ***preventing*** weight loss

- Loss of appetite ***precedes*** weight loss and we need measures beyond SNAQ the short nutritional assessment questionnaire (SNAQ©); or Simplified Nutritional Appetite Questionnaire to characterise this

Thanks to:

Dr Liam Chawner, University of Essex

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Dr Chris McLeod, Loughborough University

Biotechnology and Biological Sciences Research Council
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