Food fortification in aged care and in community-dwelling older adults: a review of strategies and issues

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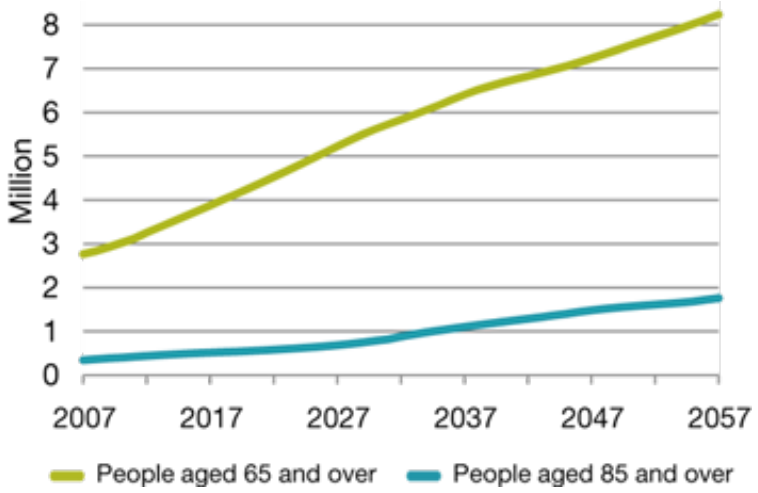
Background

In Australia:

- 1 in every 6 people are over 65 years of age[1]
- Rapid acceleration for the over 65 and over 85 aged groups[2]

Population projections 2007 to 2057[2]



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Malnutrition

- Characterised by **unintentional** loss of body weight and lean body mass[3]
- On average **50%** of the elderly population in aged care homes are malnourished[3]

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Who is at risk?

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Food-first strategies

Food fortification:

- Adding ingredients to make foods more nutrient dense, without increasing the volume of food on offer[4]
- Can be **pre-made** or **made on-site**

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Nutrition requirements

Protein:

- **1-1.2g/kg/day** for older adults[6]
- 1.5g/kg/day for older adults with an acute or chronic condition[6]
- **~25-30g per meal**[6]

Vitamins & minerals:

- Folate, vitamin D, vitamin A, vitamin C, vitamin E and vitamin B_{12}[7]
- Magnesium, calcium, selenium and zinc[7]

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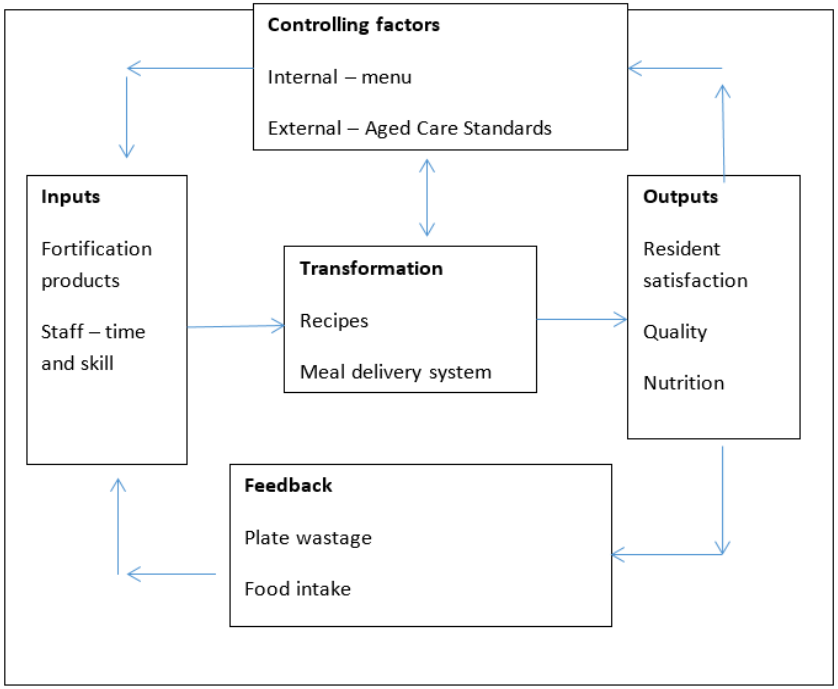
Foodservice systems model

Residents in aged care depend on the foodservice system to provide their food[8]

This food is usually their **sole source** of nutrition[8]



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Review

The purpose of this narrative review was to determine the scope and strength of published works exploring relationships between **food fortification strategies**, **mode of delivery** and **sustainability** in aged care and community-dwelling older adults and discuss implications for practice.

Previous reviews have not considered the foodservice system, meal delivery system or intervention costs[8, 9]

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Search strategy

Electronic databases:

- PubMed, EMBASE, CINAHL and Scopus

Grey literature:

- Google, Google Scholar, The Australian Bureau of Statistics, The National Health and Medical Research Council, The Department of Health and Food Standards Australia and New Zealand

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Inclusion criteria

Articles were **included** if:

- The study population was older adults
- The study setting was aged care or community
- Published in English
- Available in full-text

There were **no restrictions** placed on study design or year of publication

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Included studies

JBI methodology[11]:

- Five studies rated moderate quality
- Seventeen studies rated high quality

Study design:

- Fifteen randomised controlled trials
- Six quasi-experimental studies
- One case series

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Results

- Five studies in community dwelling older adults and 17 studies in residential aged care homes
- Fifteen studies used pre-made fortification products and 7 used on-site food fortification
- Great heterogeneity in mode of delivery and menu delivery across studies

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Aim of fortification

The **aim of fortification** was to increase:

- Protein & energy (3)
- Protein (7)
- Energy (2)
- Vitamin D (3)
- Vitamin D & calcium (4)
- Vitamin D, calcium & folate (1)
- Folic acid (1)
- Combination of protein, energy & micronutrients (1)

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Food vehicles

- Bread (4)
- Brioche
- Bun (3)
- Cakes
- Cereal
- Cheese (2)
- Cream of wheat
- Dairy desserts
- Dairy drinks
- Dessert (2)
- Drinking yoghurt
- Fruit juices (3)
- Grits
- Hot meals (2)
- Ice cream
- Margarine
- Mashed potatoes (2)
- Meat
- Meat soufflé
- Milk (2)
- Milk-based snacks
- Milk drink (2)
- Personalised to the normal dietary intake of participants
- Porridge (3)
- Potatoes
- Potato side dish
- Readymade meals
- Sauces
- Soups (7)
- Yoghurts (2)

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Intervention costs

Two studies measured intervention costs

- $0.18 per resident per day
- $1.81 per resident per day

Costs were calculated **per resident per day** and did not consider staff costs

Foods were fortified with **common kitchen ingredients** including; double cream and butter and cream, cheese, oil, butter, sour cream, hydrolysed starch respectively

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Findings

- Food fortification strategies are effective in **increasing protein, energy and micronutrient intakes** in older adults
- No clear mode of delivery within foodservices could be identified
- Few studies considered the sustainability of their intervention, although a nutrition champion may be beneficial

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Limitations

- Great **heterogeneity**, therefore it is difficult to draw conclusions
- No studies considered the foodservice system
- Only 2 studies measured intervention costs

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Future research

- Should measure intervention costs, including associated staff costs
- Should consider acceptability and sustainability
- The perspectives of staff who work in aged care need to be sought

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