



THE UNIVERSITY OF  
MELBOURNE

# Fighting Fractures and Falls with Food: From Science to Practice

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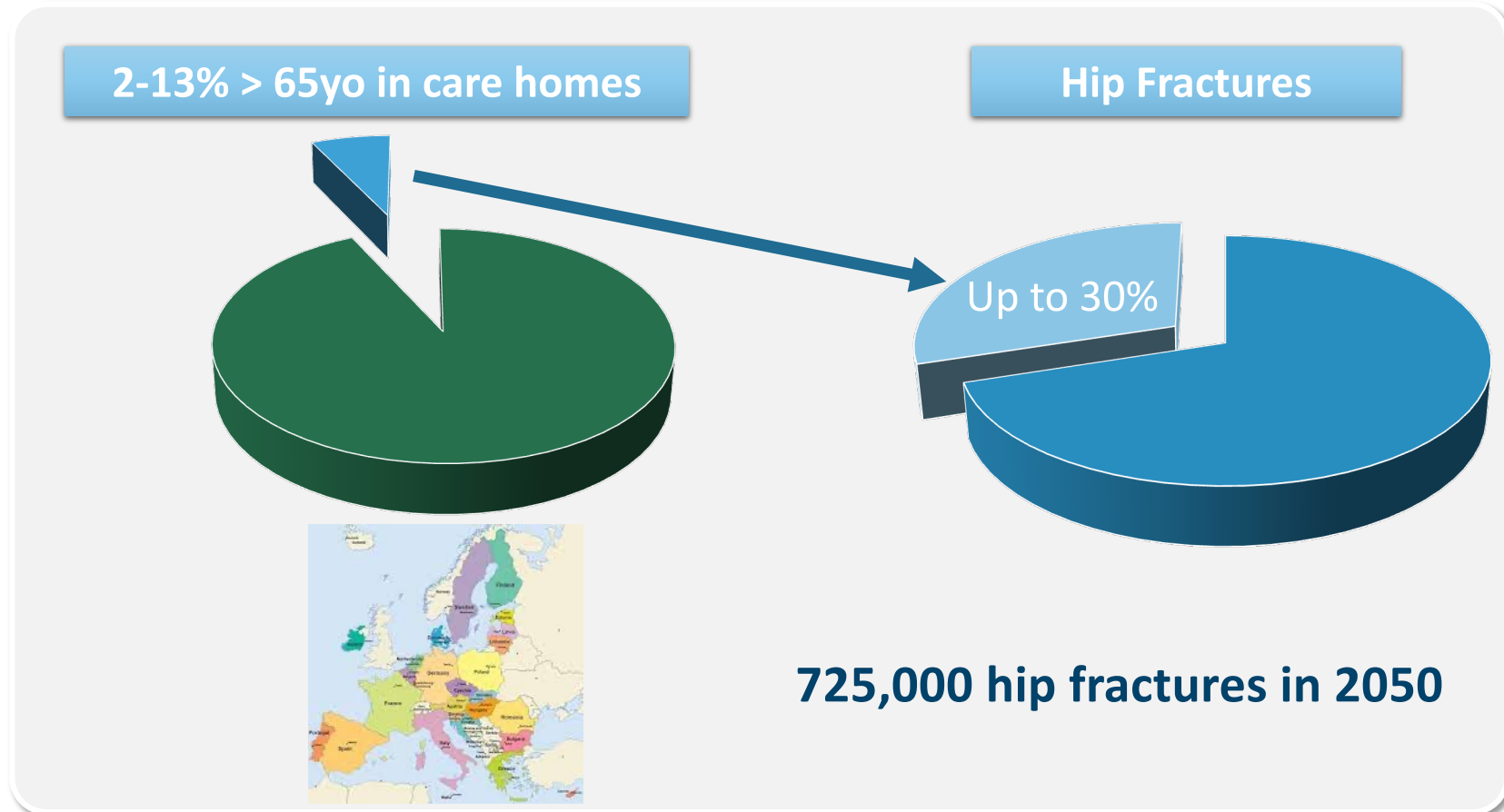
Australian Institute of Musculoskeletal Science

## Disclosures

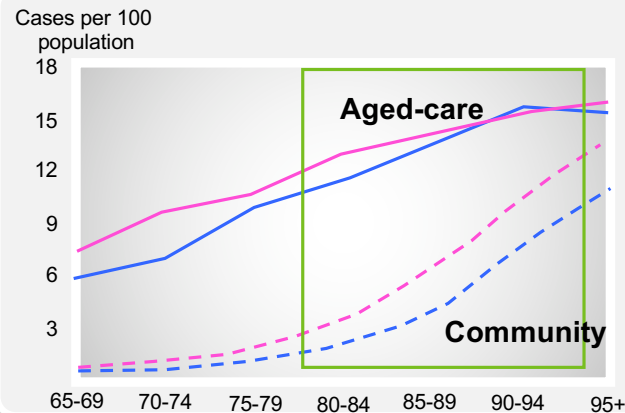
- Abbott: Advisory board / lecture fees
- UK Dairy Council: Expert group-healthy aging
- European Milk Forum: Travel support / lecture fees
- Nestle Health Sciences: Lecture fees
- Israel Milk Board: Lecture fees
- Research support



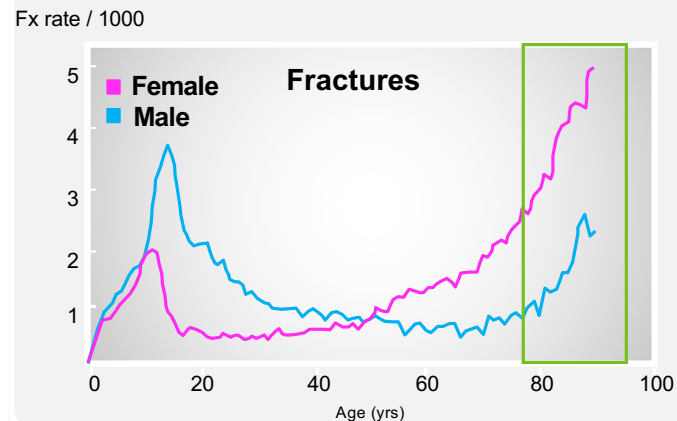
## Hip Fracture Burden From Care Homes in Europe



# Falls & Fractures in Older Adults



- Falls rates **5 x higher** in aged-care
- **7-20%** of people aged 70+ years fall.
- **30-60%** of older adults in aged care fall.



- **Up to 30%** of hip fractures from aged-care
- Hip fractures cost
  - € 24,000 to health system
  - € 2,700 to the aged care home

## Why Improve Nutrition in Aged Care Residents?

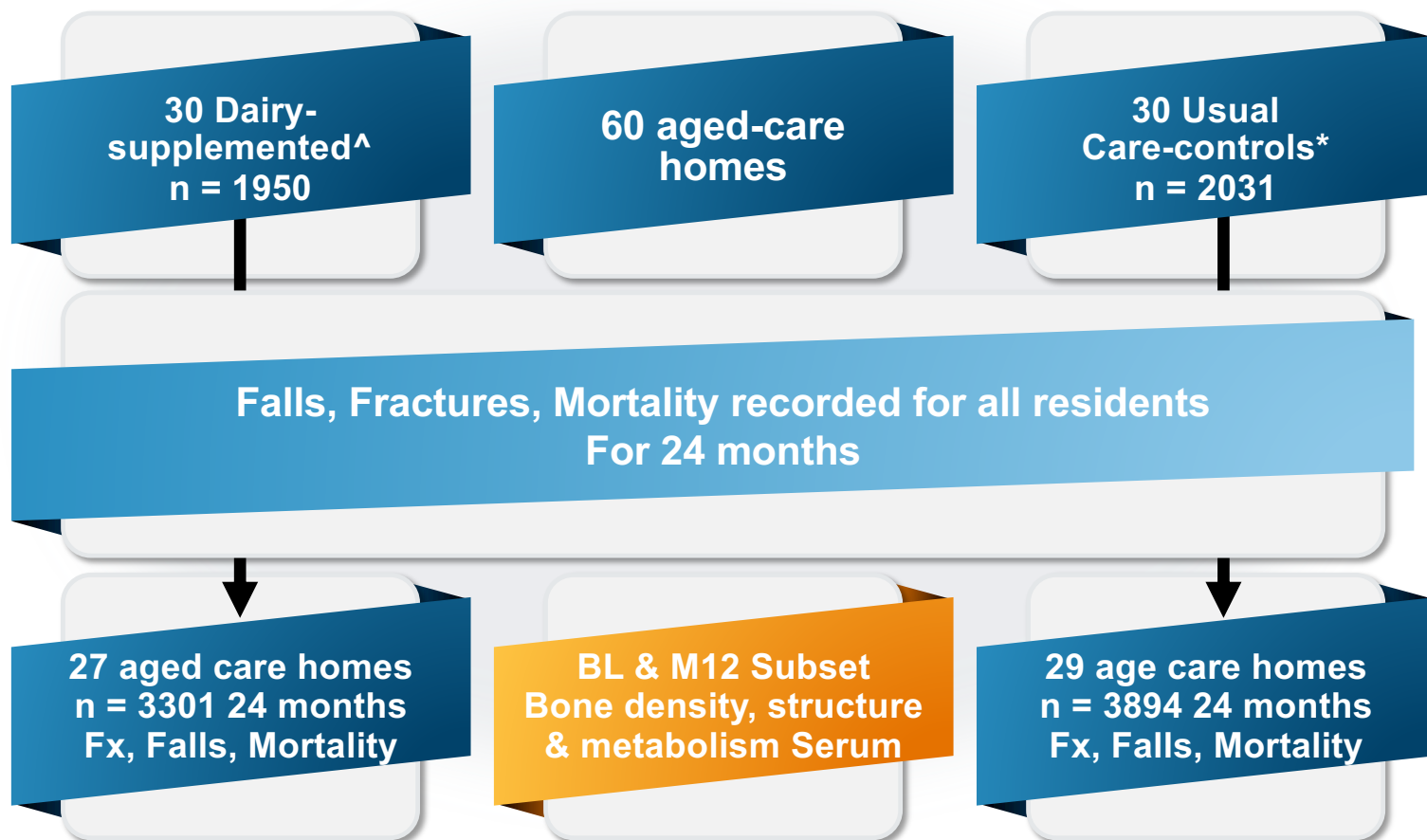
- Source of 30% of hip fractures in the community.
- Falls rates are 5 times higher than community peers.
- High rates of malnutrition.
- Calcium intake 635 mg/day
- Protein intake 0.8g / kg body weight
- Dairy intake 1.5 serving daily\*

\*250 ml milk, 200 g yoghurt, 40 g cheese

**Can improved nutrition using a food-based approach reduce falls & fracture risk in older adults in living in aged-care homes?**



# Dairy and Fracture Study



# Study Design

Food service supported  
to increase dairy  
options on the menu

Addition



Fortification



Substitution



Modification



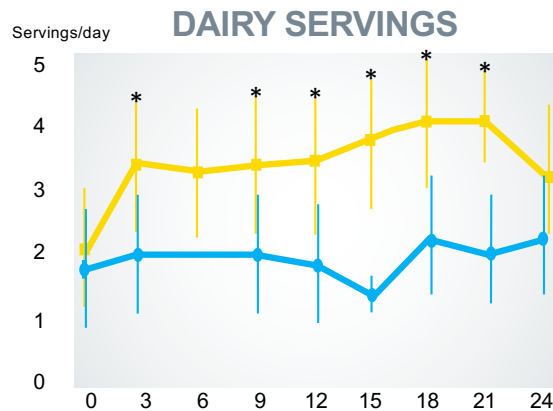


## Demographics of Aged Care Residents

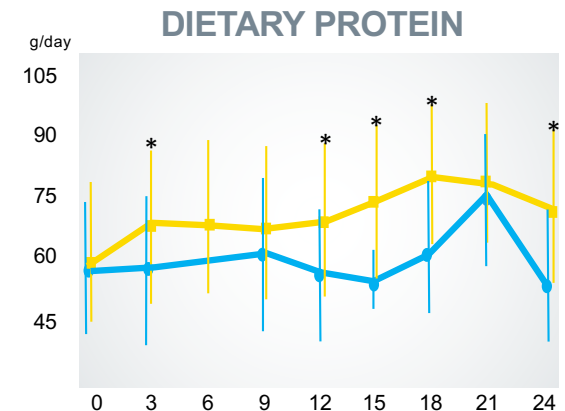
	Intervention n=3301	Controls n=3894
Women (n; %)	2194 (66%)	2680 (69%)
Age (yrs)	87 (8)	86 (8)
Height (m)	1.60 (0.1)	1.60 (0.1)
Weight (kg)	66.5 (15.6)	66.2 (15.8)
Medications (n)*	12 (6)	12 (7)
Medical Conditions (n)*	10 (5)	10 (7)
	n=170	n=130
25(OH)D (nmol/L)	72 (29)	73 (26)

## Improved Nutrient intake with Dairy Foods

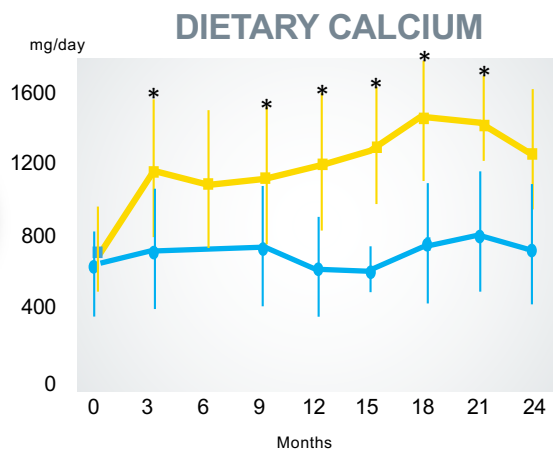
**~3.5**  
Servings  
daily



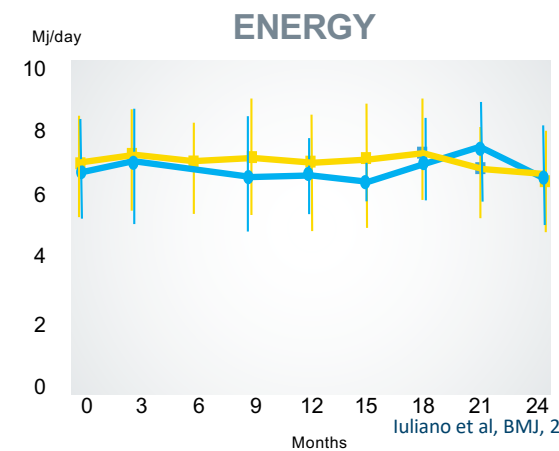
**72g/day**  
**1.1g/kg BW**



**~1100**  
Mg/day

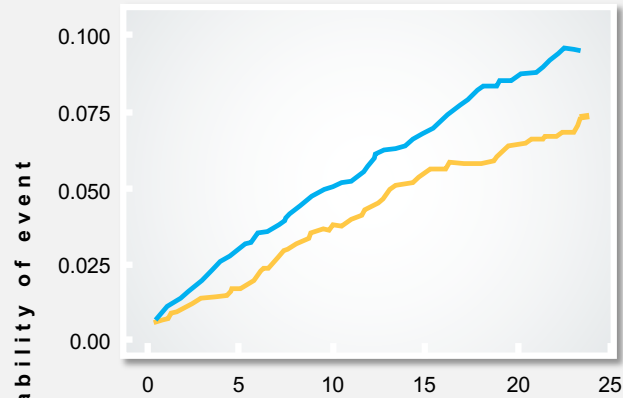


**No**  
**Change**



## Reduced Fractures with Dairy Foods

ALL FRACTURES



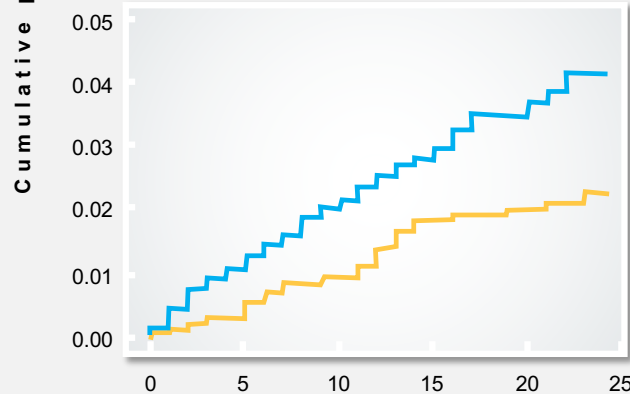
- **33% ↓ in all fractures**

- Bone density maintained in dairy group, declined in controls

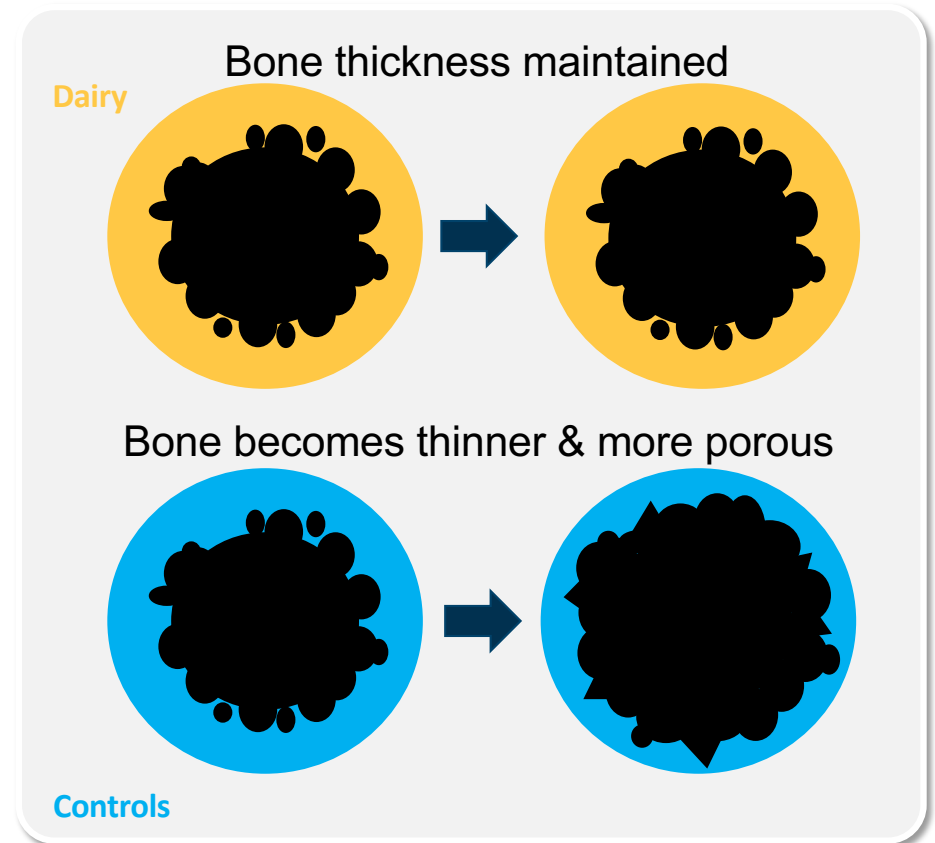
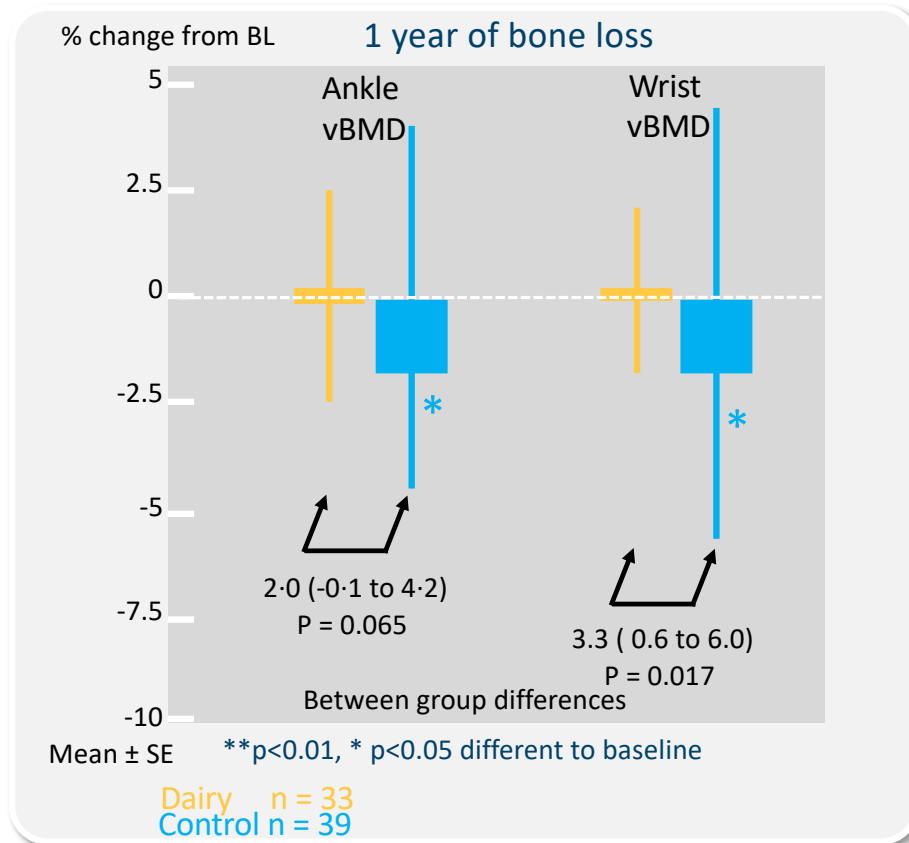
- Bone breakdown maintained in dairy group, increased in controls

- **46% ↓ in hip fractures**

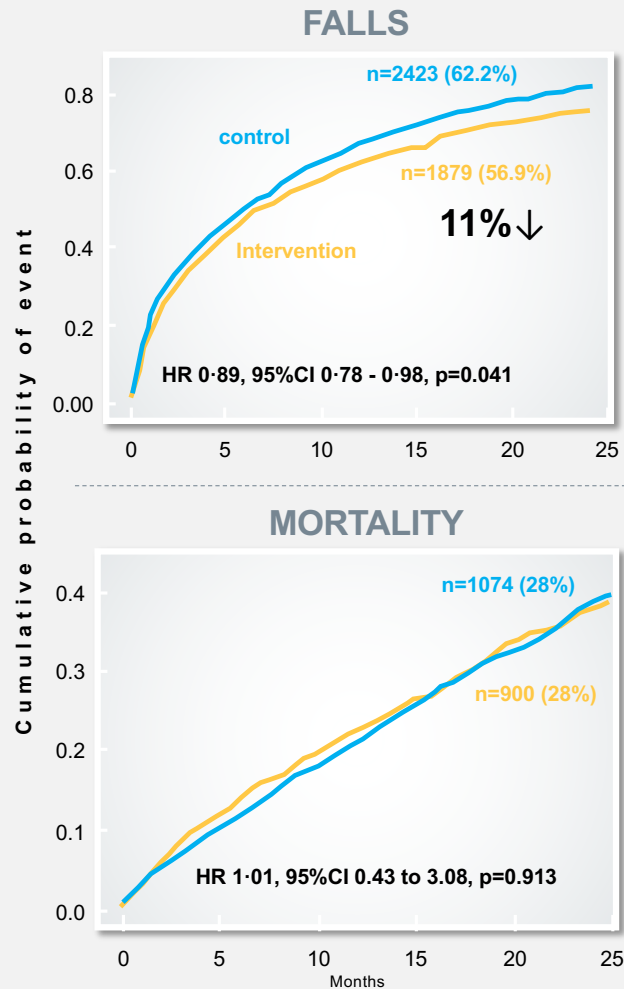
HIP FRACTURES



## Dairy Foods & Bone Density in Older Adults

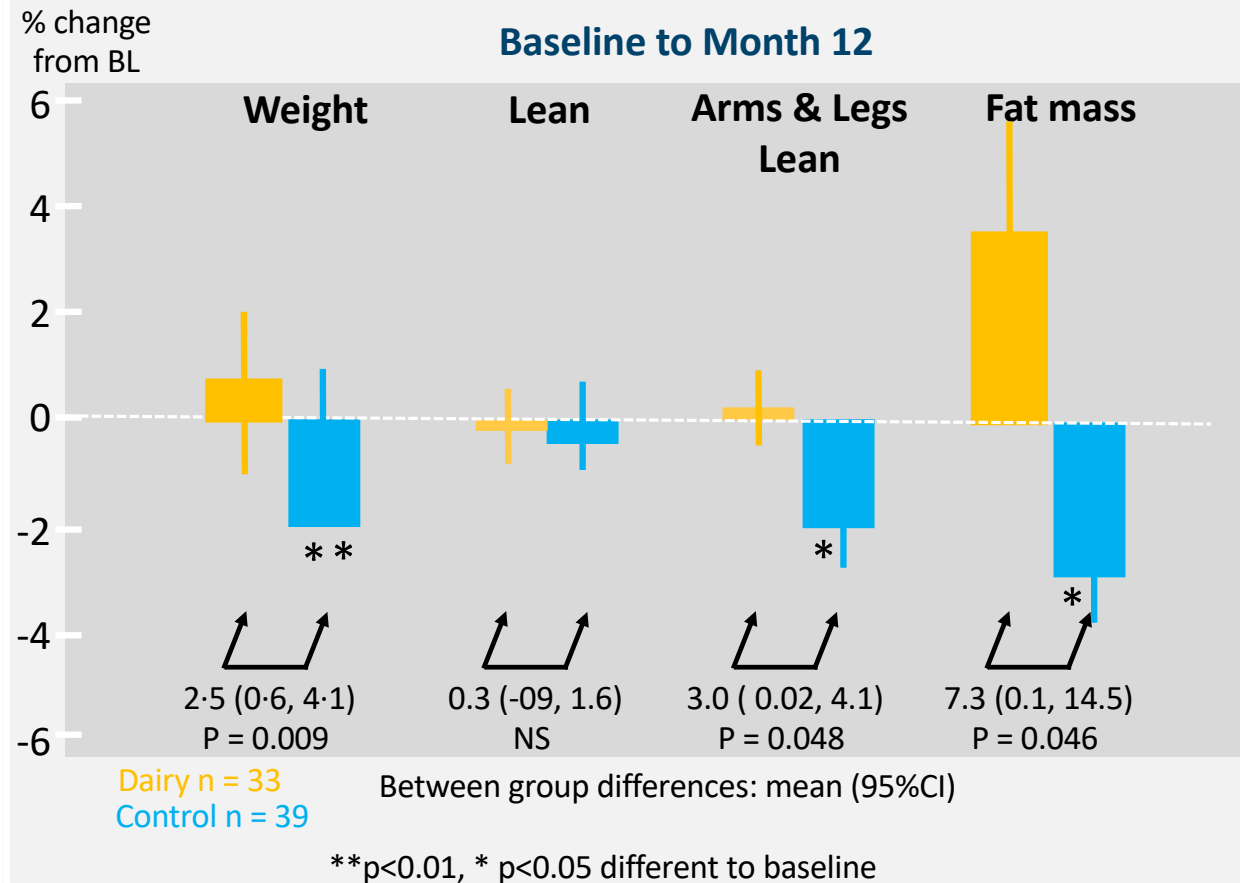


# Reduced Falls & Unchanged Mortality with Dairy Foods

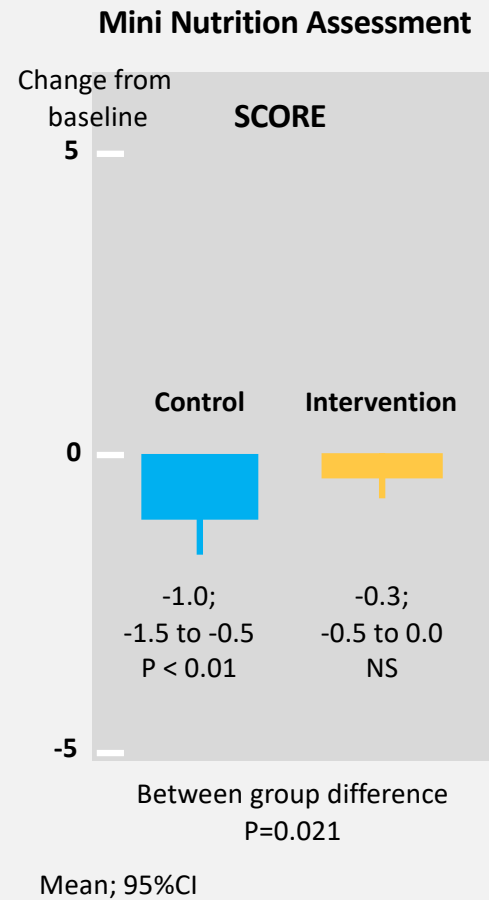


- **11% ↓ in falls**
- **Maintained:**
  - (i) weight
  - (ii) muscle at arms & legs
  - (iii) nutritional status
- **Same life expectancy with fewer falls & fractures**

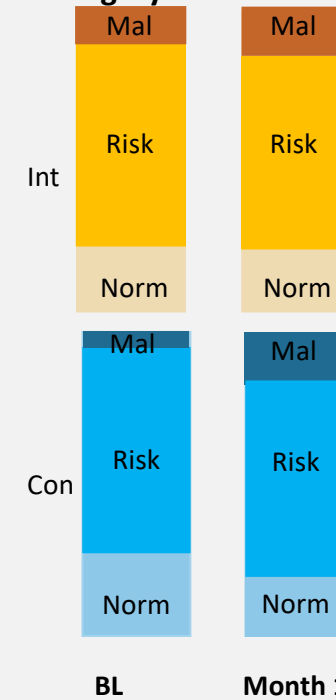
# Weight & Lean Mass of Arms & Legs Maintained with Dairy Foods



# Nutritional Status Maintained with Dairy Foods

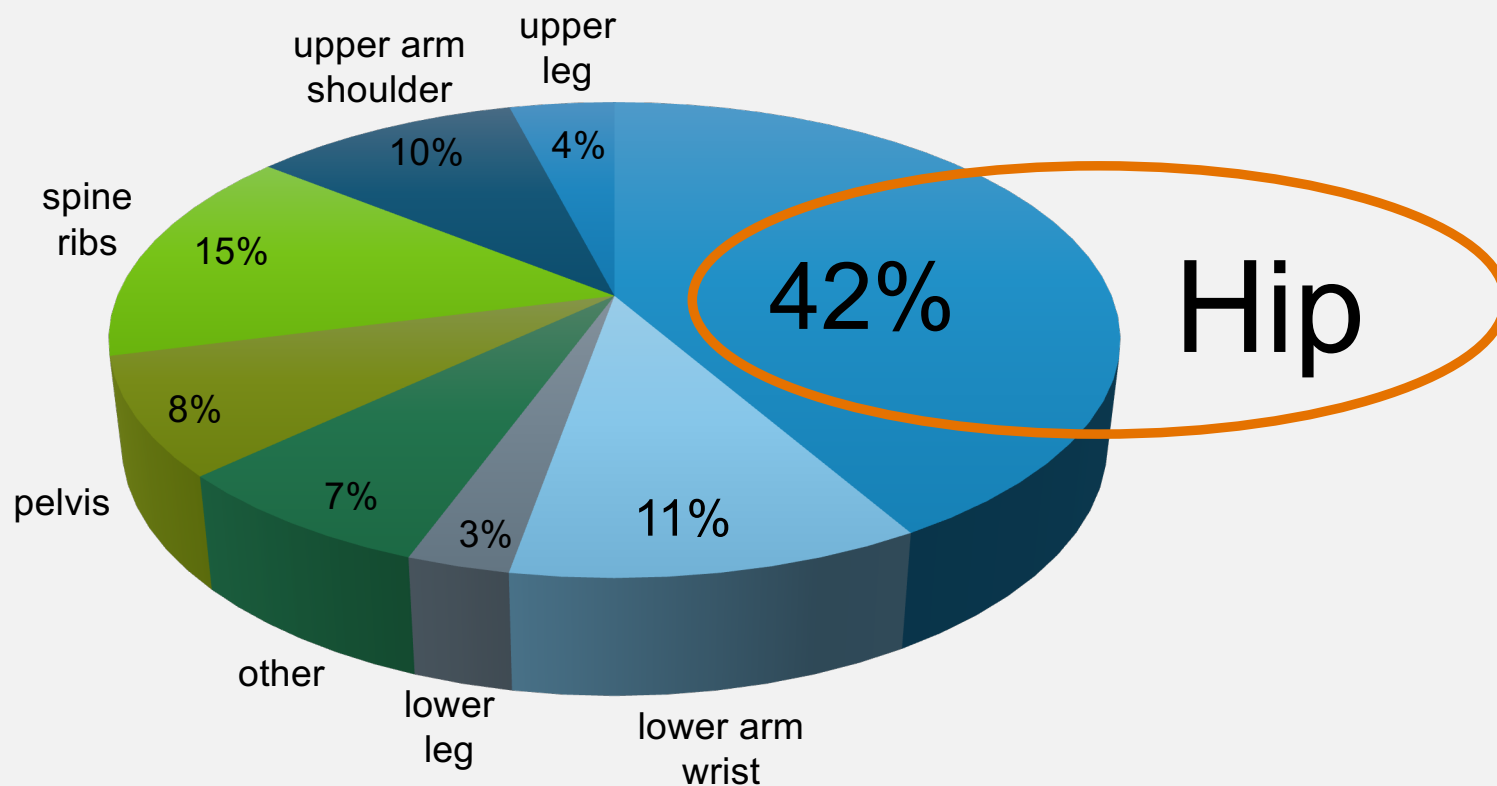


**Proportion of residents in each category of nutritional status**



Decline in Nutritional Status  
Int 22% v Con 32%, p = 0.019

## Fractures Types in Aged Care



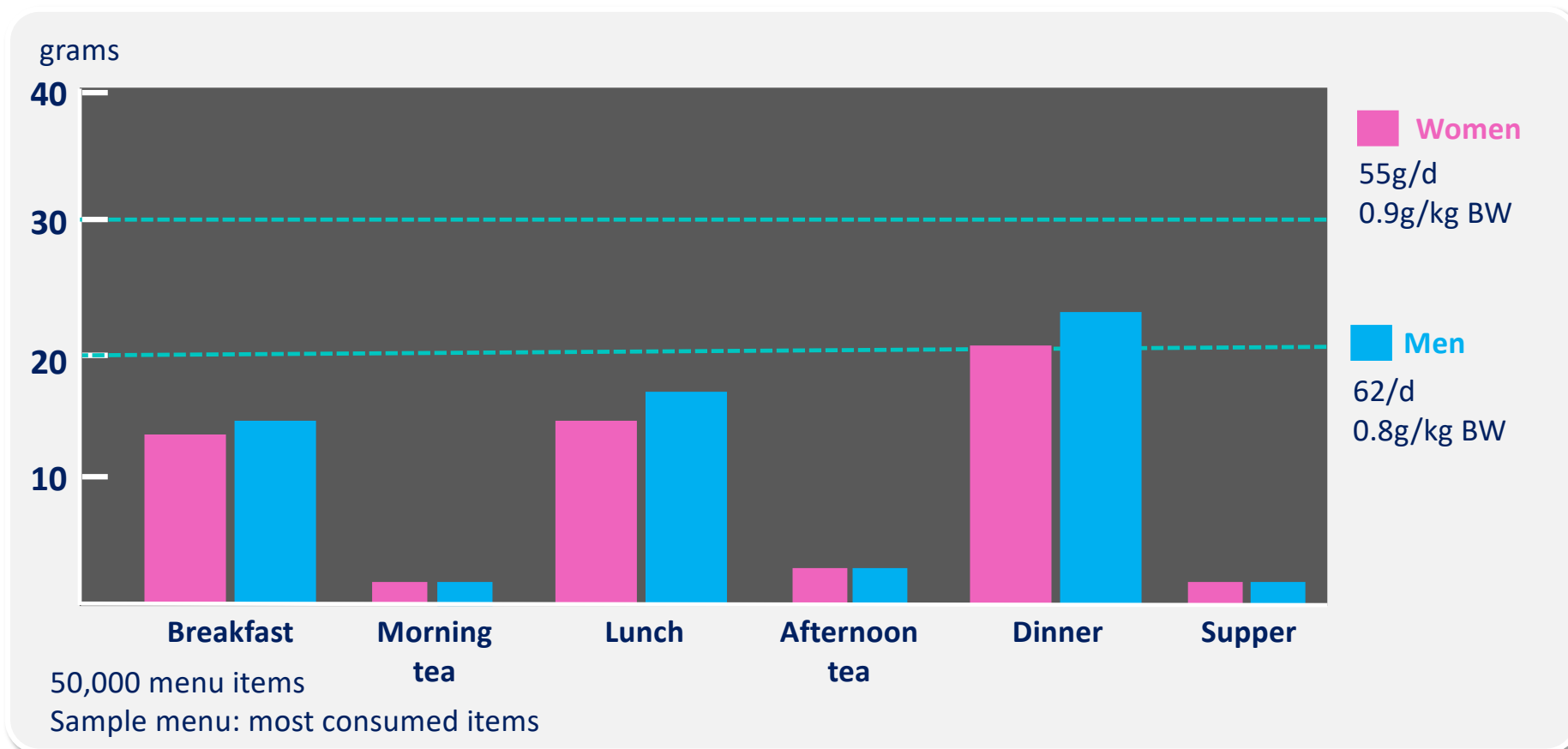


## Cost of Hip Fractures in Aged Care



Cost of Dairy Food  
< € 0.6 per resident per day

## Protein Intake in Older Adults in Aged Care



# Food Consumption in Older Adults in Aged Care Homes

## Breakfast

Cereal  
Toast  
Tea/coffee  
Juice



## Lunch

Meat  
Vegetables  
Non-dairy dessert  
Non-milk drink



## Dinner

Soup-min protein  
Salad-min protein  
Sandwich-protein  
Non-milk drink

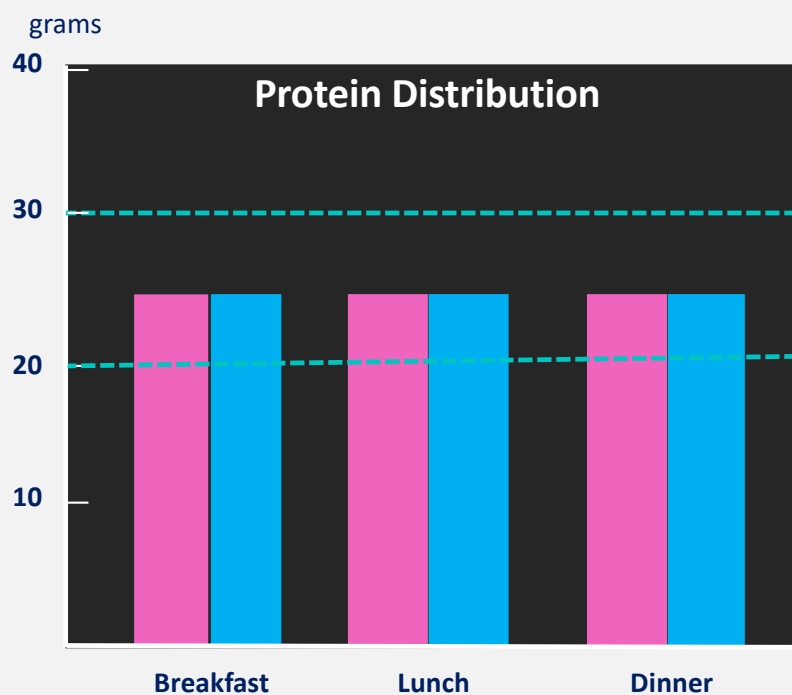


## Snacks

Biscuit / cake  
Tea/coffee



## Improving Protein Distribution with Food



### Breakfast

Scrambled eggs + cheese 18 g  
Bacon short cuts 8 g  
Bread slice 2g  
= 28 grams protein

### Lunch

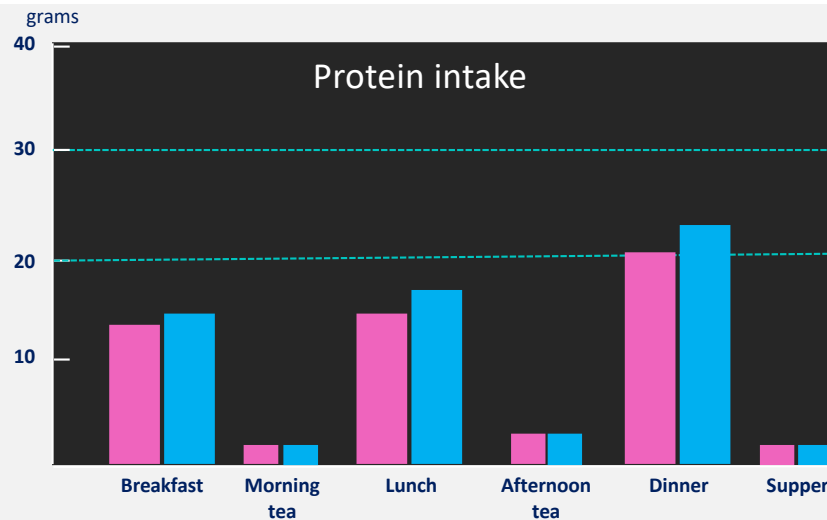
Roast beef 15 g  
Vegetable mornay 8 g  
Custard + fruit 4 g  
= 27 grams protein

### Dinner

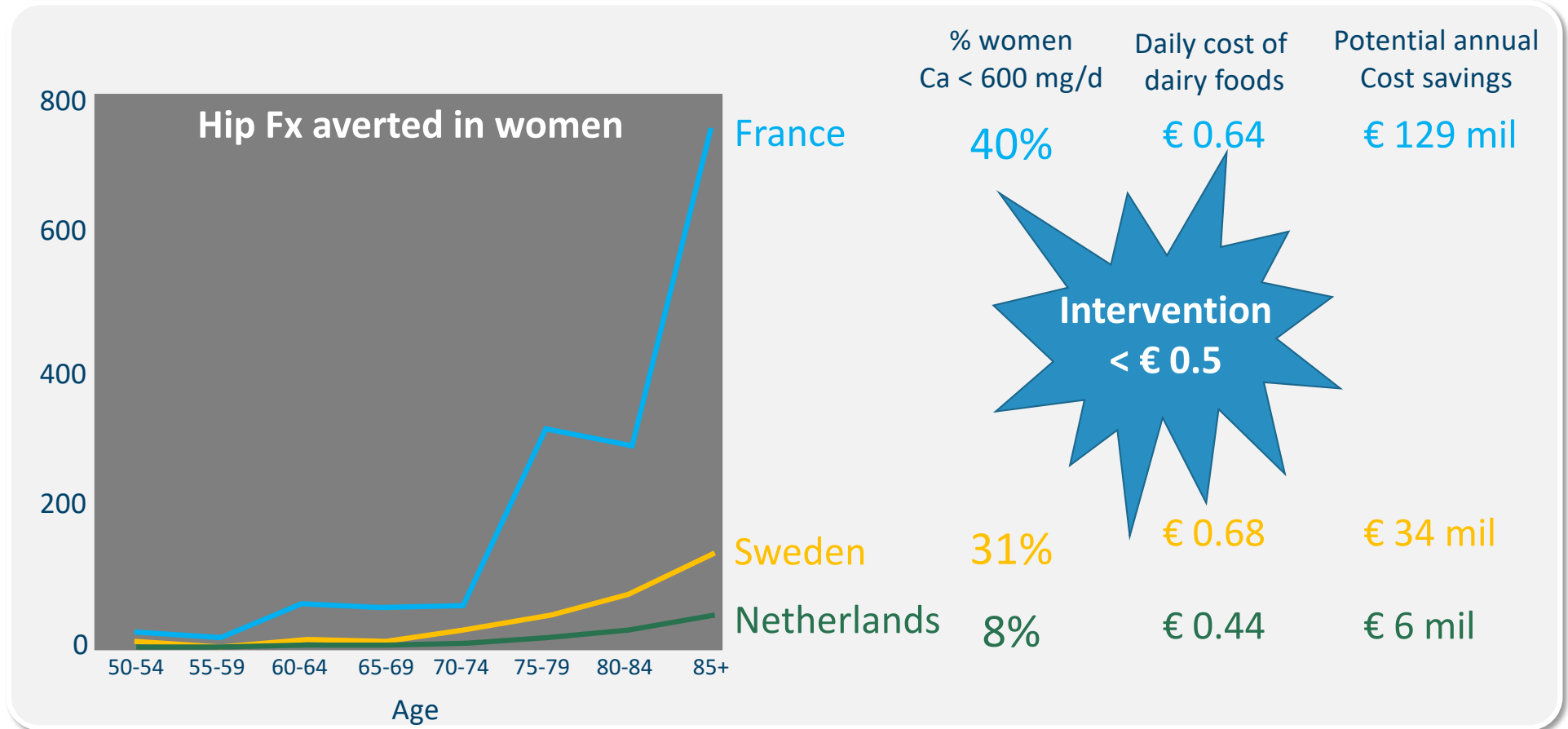
Soup + cheese 7 g  
Cheese quiche 17 g  
= 25 grams protein

## Improving Protein Distribution with Food

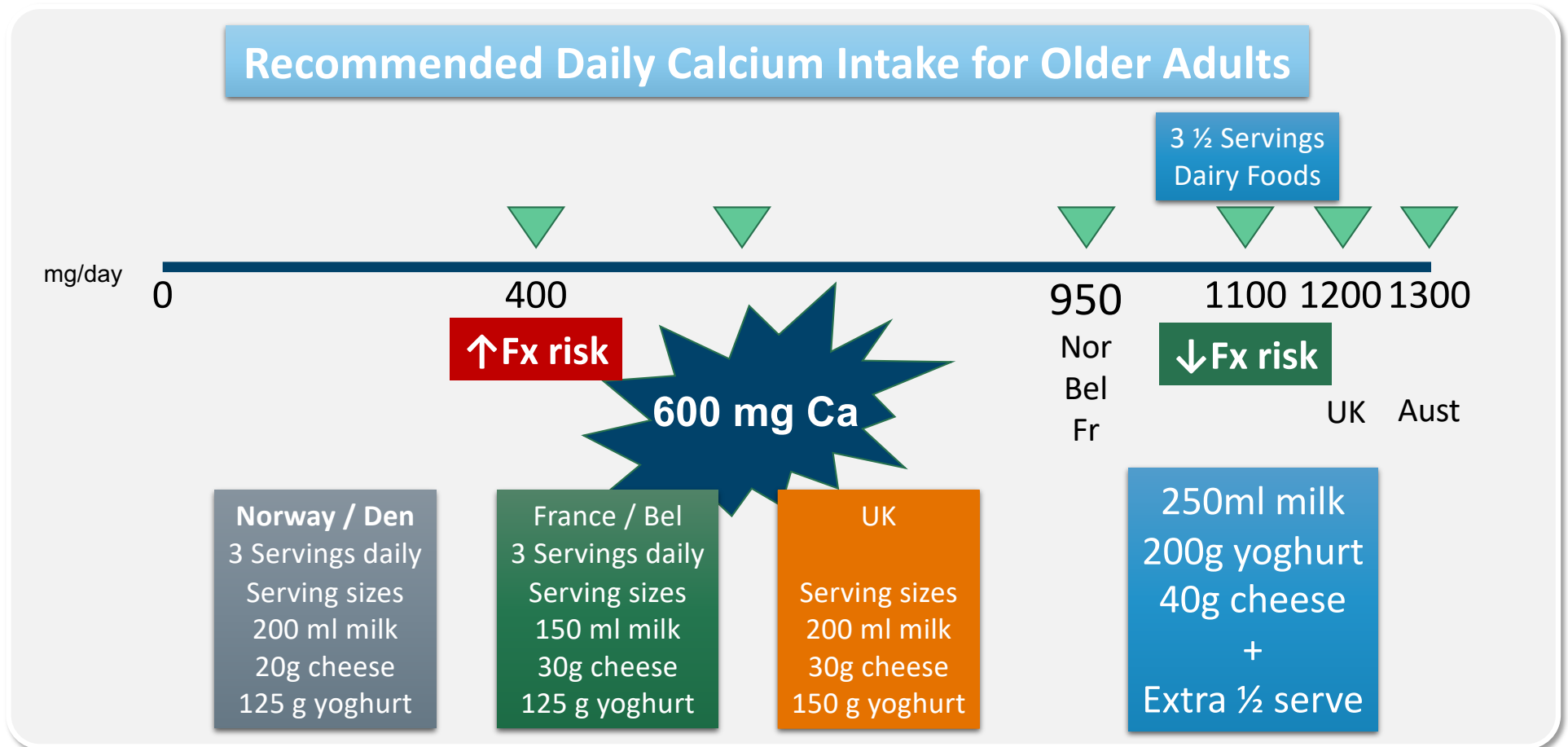
- Multiple options across the day
- Consider if snacks are consumed
- Residents' preferences
- Staff engagement
  - Skill levels
  - Facilities available



# Hip Fractures Averted With Increased Dairy Consumption



# Translating Evidence to Policy: Calcium & Dairy Intake



# The Importance of Implementation







## Our Aims

- ✓ Put research into practice
- ✓ Resource & upskill staff
- ✓ Support best practice

To optimise health  
in older adults in our care

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