



# Dietary intake on nutrients and periodontal health of older men: the Concord Health and Ageing in Men Project



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# Background

- Periodontal disease is an inflammatory condition.
- More than half of Australian adults aged 65 years and older have moderate to severe periodontal disease.
- Studies have found associations between individual nutrients, or food groups, and periodontal disease.
- Research in older populations is limited.
- Most research looks at single nutrients or food groups, rather than the overall diet.



# Objective

- The aim of this study was to examine the association between dietary intake of nutrients and its impact on periodontal health in community dwelling older men participating in the Concord Health and Ageing Men Project (CHAMP) study).





# 8-Yr Follow Up Methods

- Two Home Visits and a Self-Completed Questionnaire (SCQ)
- Clinic Visit
  - SCQ was checked and collected.
  - Weight, height, blood pressure, medication, alcohol intake, and frailty measures were all assessed.
  - SAS was used for statistical analysis.
- Examiners also assessed participant's diet history.
- All data was analysed through SPSS.



# Diet History

- The dietitians were trained to use a structured questionnaire with open-ended questions.
- Food quantities were established by food models, photographs and household measures.
- This method was validated during the 5 year follow up, comparing it to a 4 day weighed food record, in a group of 56 CHAMP men.
- Data was entered into Food Works 7.



# Periodontal Examination

- Conducted by two trained oral health therapists.
- Edentulous participants, and those who answered yes one or more questions on a screening tool in regards to cardiovascular history
- All natural teeth, except second and third molars, were examined. 3 sites per teeth were assessed.
- Examiners collected information on recession, probing depth (PD), gingivitis, plaque and calculus
- Information on numbers of teeth, denture use and hygiene practices were also collected.



# Dietary Variables

- Individual **macronutrients** and **micronutrients** assessed as to whether they meet recommendations (e.g. EAR, AI, AMDR etc), according to the **Australian Nutrient Reference Values (NRV)**.
- Individual nutrients were divided into **quartiles**.
- **7** macronutrients incorporated into a **'Macronutrient' risk variable** that was dichotomized as 'Good Intake' ( $>4$ ) or 'Poor Intake' ( $\leq 4$ ).
- **16** micronutrients incorporated into a **'Micronutrient' risk variable** that was dichotomized as 'Good Intake' ( $\geq 12$ ) or 'Poor Intake' ( $\leq 11$ ).

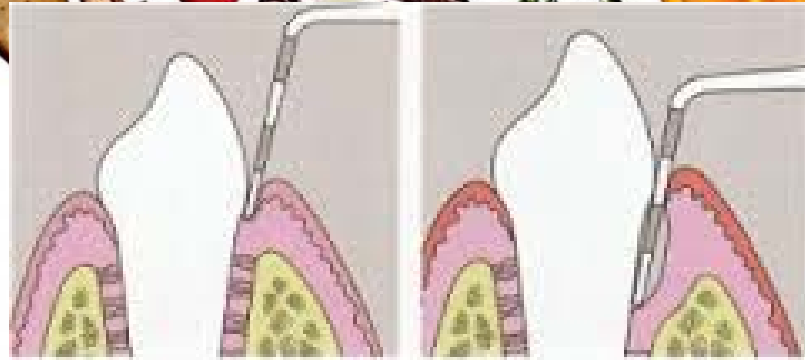




# Periodontal Assessment

- **Three sites;** mesio-buccal, buccal and distal-buccal, were assessed for:
  - **Gingival Recession**
  - **Probing Depth**
- Maximum of **28** teeth, **84** sites were examined.

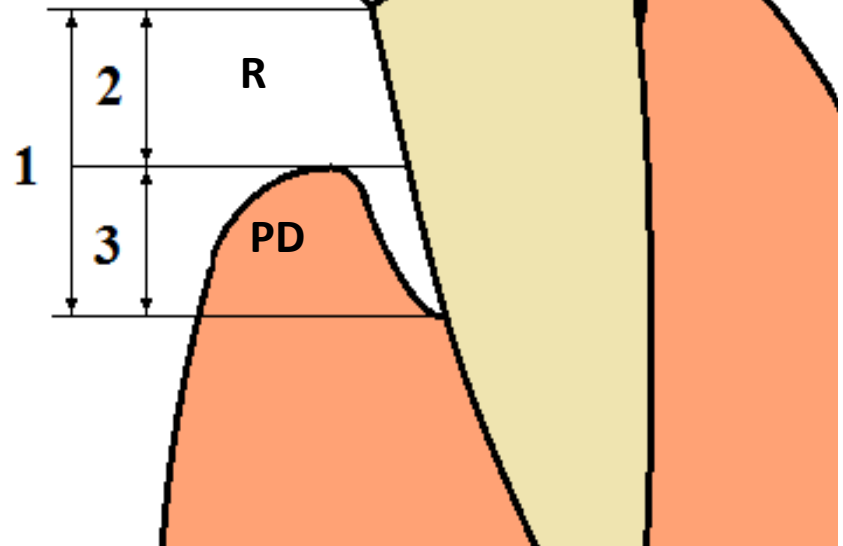
# Periodontal Assessment



Periodontal probe around healthy gums.

Periodontal probe in a periodontal pocket

- 1= CAL
- 2= Recession
- 3= Pocket depth

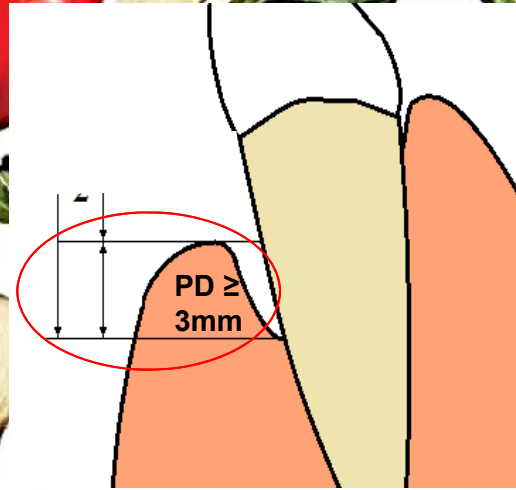
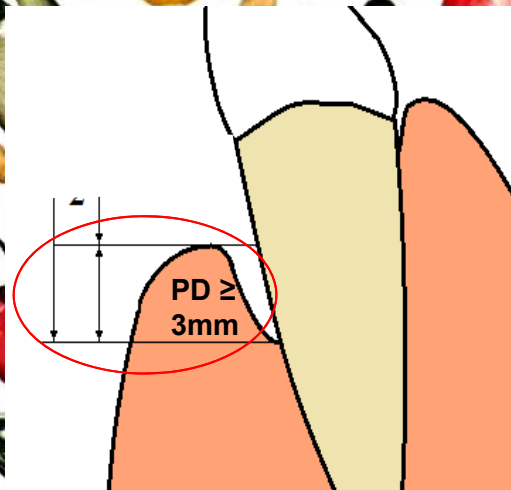
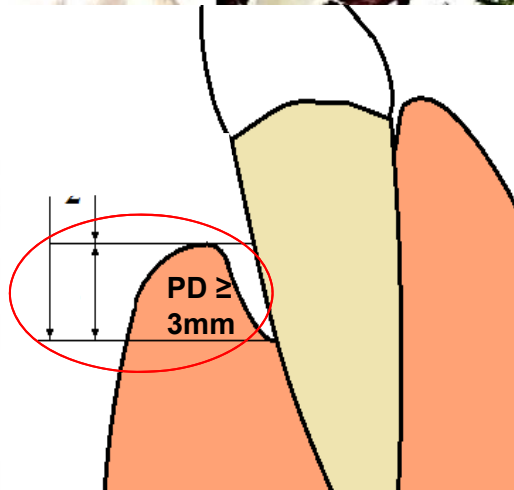


# Probing Depth

This was dichotomised into participants:

- with **3 teeth** with a Probing Depth of **3mm or greater**.

- with **< 3 teeth** with a Probing Depth of **3mm or greater**.

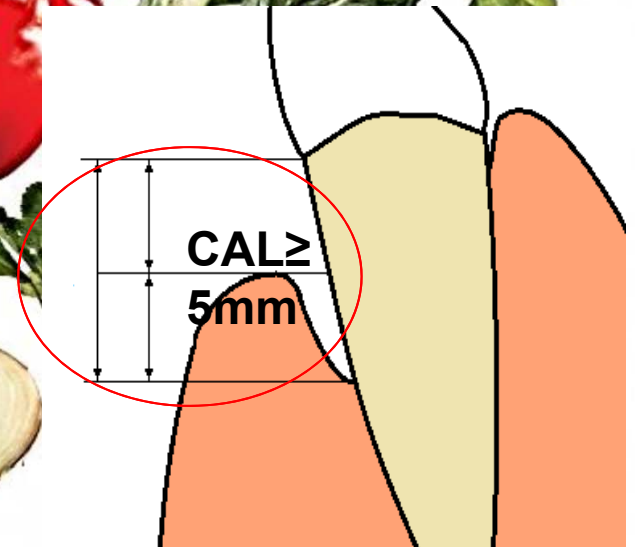
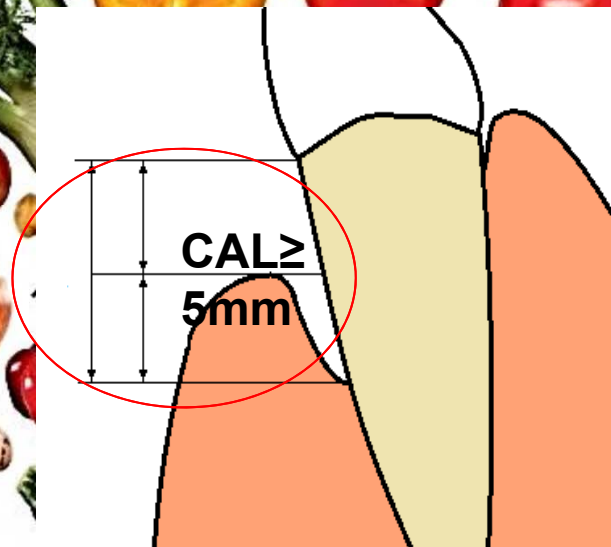
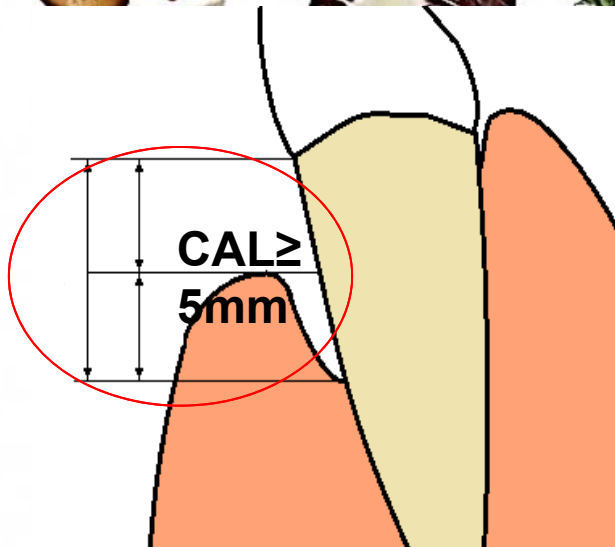


# Clinical Attachment Loss

• This was dichotomised into participants:

- with **3 teeth** with a Attachment Loss of **5mm or greater**.

- with **< 3 teeth** with a Attachment Loss of **5mm or greater**





# Demographic Results

- Mean Age ( $\pm$ SD) : **83.5 ( $\pm$ 3.7)** Range: **78 – 96**
- Pension only: 37%
- Living alone: 21%
- Country of Birth – Australian born: 52%
- Non-smokers: 44%
- Mean BMI: 27.6 kg/cm<sup>2</sup>
- Post School Qualifications: 61%



# Nutrition Results

- Majority of participants did meet the NRVs for these nutrients:
- Protein g/kg (89%)
- Protein AMDR (82%)
- ALA NRV (54%)
- Thiamin EAR (87%)
- Riboflavin EAR (92%)
- Niacin EAR (100%)
- Vitamin C EAR (97%)
- Vitamin E EAR (53%)
- Folate EAR (66%)
- Vitamin A EAR (81%)
- Sodium UL (63%)
- Phosphorus EAR (100%)
- Iron EAR (99%)
- Zinc EAR (58%)
- Iodine AI (65%)



# Nutrition Results

- Majority of participants did not meet the NRVs for these Nutrients
- Energy (68%)
- Carb AMDR (84%)
- Fat AMDR (62%)
- SFA AMDR (76%)
- Fibre NRV (69%)
- Vitamin D EAR (100%)
- Potassium AI (68%)
- Calcium EAR (85%)



# Oral Health Results

- 2<sup>+</sup> or more teeth: 43%
- Brushes teeth > once a day: 63%
- Visits dentist every 2 years or more: 77%
- **63.6% (n=187)** had 3 teeth with a Probing Depth of 3mm or greater.
- **84.7% (n=249)** had 3 teeth with a Clinical Attachment Loss of 5mm or greater.



# Calcium (1100mg)

|                     | PD 3 teeth |    | Unadjusted          | Adjusted           |
|---------------------|------------|----|---------------------|--------------------|
|                     | n          | %  | OR (95% CI)         | OR (95% CI)        |
| Calcium             |            |    |                     |                    |
| Equal to or Greater | 22         | 50 | 1.00                | 1.00               |
| Less Than           | 165        | 66 | 1.94 (1.02 – 3.71)* | 1.75 (0.82 – 3.74) |

Adjusted by age, energy, comorbidities, birth country, alcohol intake & post-school qualifications

\*P value <0.05

Main Food Source: Cow milk (regular, reduced & skim) & cheese

# Vitamin E (10mg)

|                     | PD 3 teeth |    | Unadjusted          | Adjusted             |
|---------------------|------------|----|---------------------|----------------------|
|                     | n          | %  | OR (95% CI)         | OR (95% CI)          |
| Vitamin E           |            |    |                     |                      |
| Equal to or Greater | 108        | 69 | 1.00                | 1.00                 |
| Less Than           | 79         | 58 | 0.61 (0.38 – 0.99)* | 0.57 (0.31 – 1.06)** |

Adjusted by age, energy, comorbidities, birth country, alcohol intake & post-school qualifications

\*P value <0.05

\*\*P value trending towards <0.05

Main Food Source: Olive oil, canola oil & sunflower oil

# Alpha Linolenic Acid (1.3g)

|                     | PD 3 teeth |    | Unadjusted         | Adjusted           |
|---------------------|------------|----|--------------------|--------------------|
|                     | n          | %  | OR (95% CI)        | OR (95% CI)        |
| Alpha Linoleic Acid |            |    |                    |                    |
| Equal to or Greater | 92         | 58 | 1.00               | 1.00               |
| Less Than           | 95         | 70 | 1.66 (1.03 – 2.70) | 1.45 (0.81 – 2.62) |

Adjusted by age, energy, comorbidities, birth country, alcohol intake & post-school qualifications  
\*P value <0.05

Main Food Source: Canola oil, margarine & olive oil

# Protein (g/kg) Quartiles

|                | PD 3 teeth |    | Unadjusted          | Adjusted            |
|----------------|------------|----|---------------------|---------------------|
|                | n          | %  | OR (95% CI)         | OR (95% CI)         |
| Protein (g/kg) |            |    |                     |                     |
| Lowest         | 53         | 75 | 1.00                | 1.00                |
| Second         | 49         | 65 | 0.64 (0.31 – 1.31)  | 0.58 (0.27 – 1.25)  |
| Third          | 43         | 59 | 0.49 (0.24 – 0.99)  | 0.45 (0.21 – 0.99)  |
| Highest        | 41         | 55 | 0.42 (0.21 – 0.85)* | 0.36 (0.15 – 0.85)* |

Adjusted by age-energy, comorbidities, birth country, alcohol intake & post-school qualifications

\*P-value < 0.05  
 Main Food Source: Beef rump, cow milk (regular & reduced) & cheese

# Sugar (g) Quartiles

|           | CAL 3 teeth |    | Unadjusted         | Adjusted             |
|-----------|-------------|----|--------------------|----------------------|
|           | n           | %  | OR (95% CI)        | OR (95% CI)          |
| Sugar (g) |             |    |                    |                      |
| Lowest    | 57          | 78 | 1.00               | 1.00                 |
| Second    | 66          | 89 | 2.32 (0.92 – 5.81) | 2.98 (1.09 – 8.19)   |
| Third     | 62          | 85 | 1.58 (0.68 – 3.69) | 2.23 (0.84 – 5.85)   |
| Highest   | 64          | 86 | 1.80 (0.76 – 4.28) | 3.24 (1.01 – 10.33)* |

Adjusted by age, energy, comorbidities, alcohol intake, post-school qualifications & self-rated oral health

\*P value <0.05

Main Food Source: Cow Milk (regular), white sugar & banana

# Macronutrient

|               | PD 3 teeth |    | Unadjusted         | Adjusted           |
|---------------|------------|----|--------------------|--------------------|
|               | n          | %  | OR (95% CI)        | OR (95% CI)        |
| Macronutrient |            |    |                    |                    |
| 5 or more     | 30         | 67 | 1.00               | 1.00               |
| 4 or less     | 156        | 63 | 0.85 (0.43 – 1.66) | 0.93 (0.44 – 1.97) |

Adjusted by age, energy, comorbidities, birth country, alcohol intake & post-school qualifications

|               | CAL 3 teeth |    | Unadjusted         | Adjusted           |
|---------------|-------------|----|--------------------|--------------------|
|               | n           | %  | OR (95% CI)        | OR (95% CI)        |
| Macronutrient |             |    |                    |                    |
| 5 or more     | 40          | 89 | 1.00               | 1.00               |
| 4 or less     | 208         | 84 | 0.65 (0.24 – 1.75) | 0.63 (0.22 – 1.79) |

Adjusted by age, energy, comorbidities, alcohol intake, post-school qualifications & self-rated oral health

# Micronutrient

|               | PD 3 teeth |    | Unadjusted         | Adjusted           |
|---------------|------------|----|--------------------|--------------------|
|               | n          | %  | OR (95% CI)        | OR (95% CI)        |
| Micronutrient |            |    |                    |                    |
| 12 or more    | 72         | 67 | 1.00               | 1.00               |
| 11 or less    | 115        | 62 | 0.81 (0.49 – 1.33) | 0.74 (0.40 – 1.37) |

Adjusted by age, energy, comorbidities, birth country, alcohol intake & post-school qualifications

|               | CAL 3 teeth |    | Unadjusted         | Adjusted           |
|---------------|-------------|----|--------------------|--------------------|
|               | n           | %  | OR (95% CI)        | OR (95% CI)        |
| Micronutrient |             |    |                    |                    |
| 12 or more    | 92          | 85 | 1.00               | 1.00               |
| 11 or less    | 157         | 84 | 0.94 (0.49 – 1.83) | 1.04 (0.47 – 2.31) |

Adjusted by age, energy, comorbidities, alcohol intake, post-school qualifications & self-rated oral health




# Conclusion

- Compromised periodontal health and lower dietary intake of **protein** are associated.
- Compromised periodontal health and higher dietary intake of **sugar** are associated.
- Vitamin E, alpha-linolenic acid and calcium do not have a significant association after adjusting for confounders.
- Periodontal Health and overall diet, as measured by Micro nutrient risk factors, do not appear to have an association.
- The direction of the association cannot be established.





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