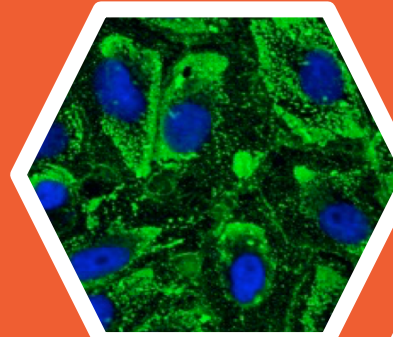


Food Processing Collaboration between Engineering and Agriculture

Dr John Kavanagh

School of Chemical and Biomolecular
Engineering

ARC Training Centre for the Australian
Food Processing Industry in the 21st
Century



THE UNIVERSITY OF
SYDNEY

AB MAURI



Australian Government
Australian Research Council



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SYDNEY



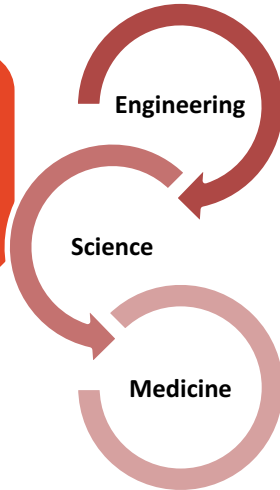
ARCFPTC

**11 Industry
Partners**

**14 Chief
Investigators**

**5 Industrial
Research
Managers (ICPDs)**

20 HDRs



Baxter

Sanitarium
health & wellbeing

PharmaCare
Laboratories



Langtech



Production of Functional Foods

**Yanwei Ma, Thomas Tarento,
Andrea Talbot, Dr Peter Valtchev,
Dr John Kavanagh, Prof Fariba
Dehghani**



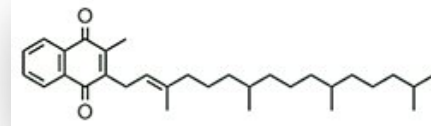
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Sources and Types of Vitamin K

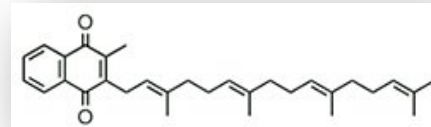
- Vitamin K is the name of a collection of vitamers that share similar structure with various chain lengths.
- Vitamin K1, also called phyloquinone, can be found in leafy green vegetable.
- Vitamin K2, namely menaquinone can be found in fermented foods such as cheese and natto.



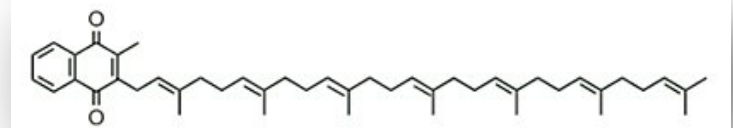
K1



MK-4



MK-7



Serum Half-Lives



K2 MK-4 1.5H



K1 1.5H



K2 MK-7 72H

Natto the Richest Source of Vitamin K7



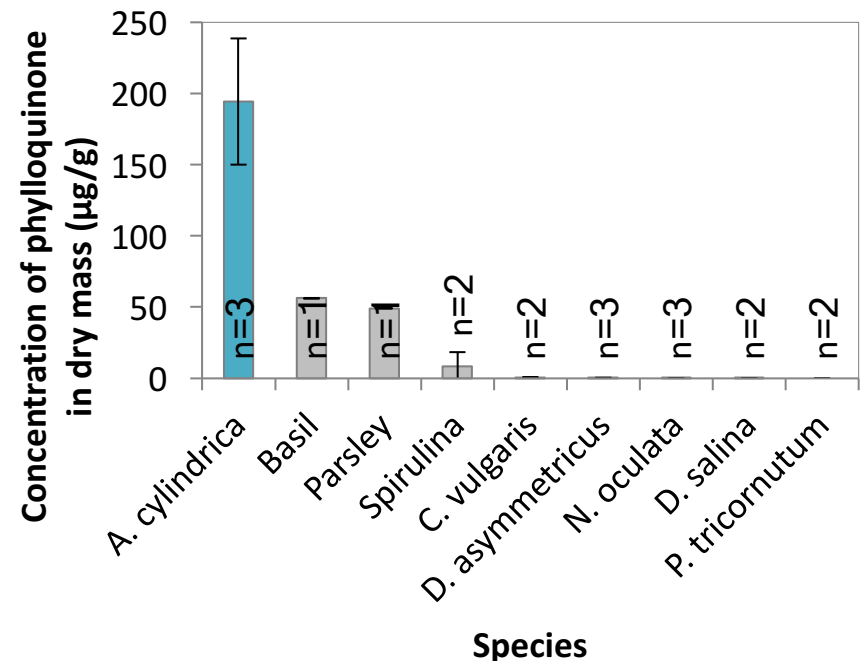
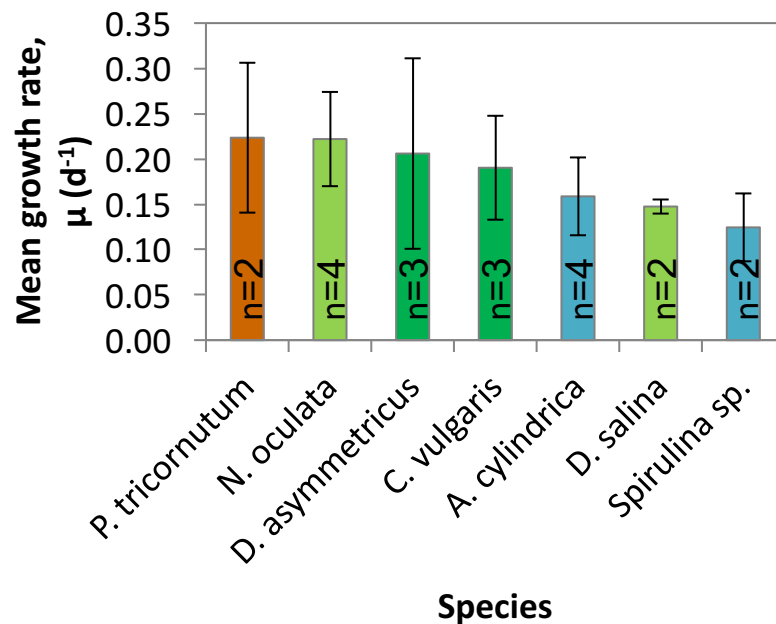
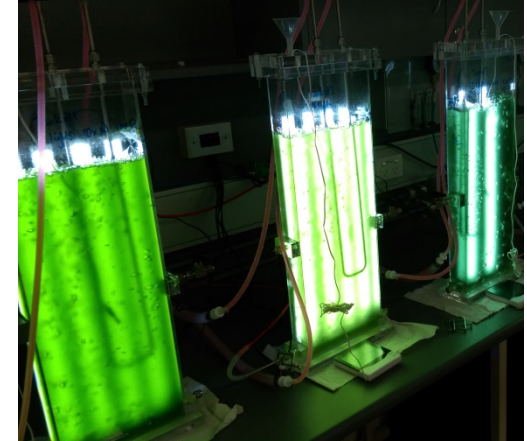
Raw Material



Natto not Palatable by Many Consumers

Rich sources of vitamin K1

- Surveyed diatoms, microalgae and cyanobacteria from fresh/salt water
- Growth rate (left) and vitamin K₁ content (right) were determined
- At 200 µg/g, around 0.5 g *A. cylindrica* would satisfy adult human intake!



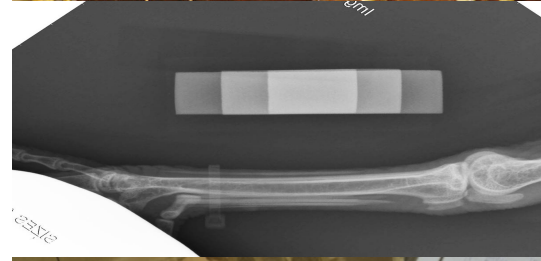
Effect of Vitamin K on Animal Welfare and Egg Quality



- Study the effect of vitamin K supplementation on the bone density of laying hens.
- Determine the vitamin K content of the eggs.

Research Outcomes

- Increased bone density over a 9 week laying period.
- Produced eggs that contained more vitamin K.
- Increased egg production.



Extraction of Valuable Compounds from Waste

**Audrey Luiz, Balakrishnan
Shammugasamy, Dr Dale McClure,
Dr Peter Valtchev,
Dr John Kavanagh, Prof Tim
Langrish, Prof Fariba Dehghani**



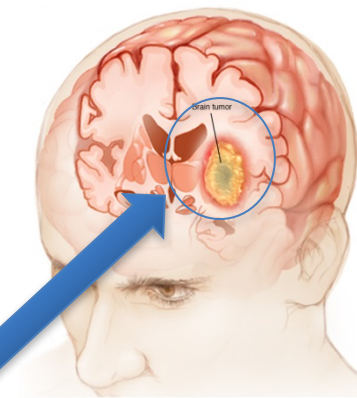
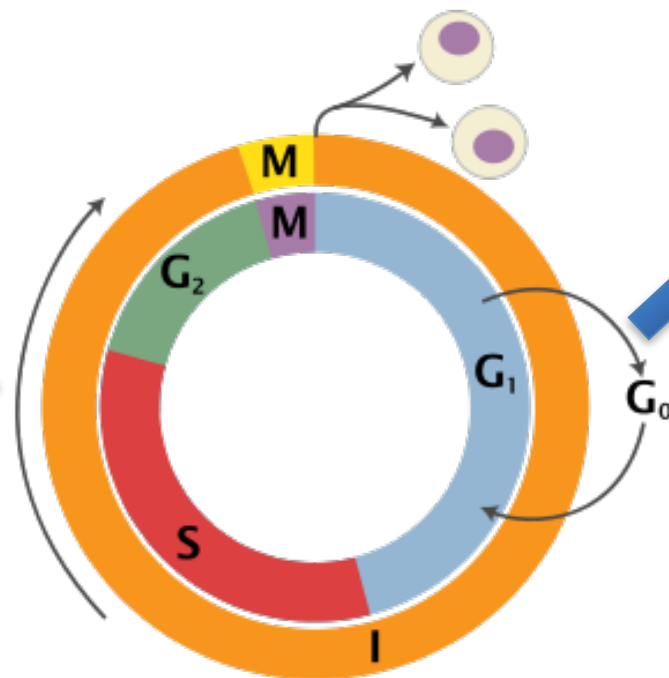
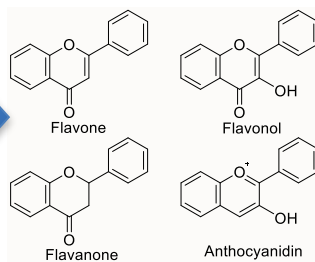
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Recovery of Active Compounds to Reduce the Risk of Cancer Recurrence



Food
wastes



Keep the cell in dormant phase

