

# Sanford's Journey

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Challenge Host



Challenge Collaborating Parties



# SUSTAINABLE BUSINESS



**Our purpose is to Share the Goodness of our Oceans with Uncompromising Care**

Quota Management System (QMS)



Supply 800 million meals globally per annual

# OUR JOURNEY TO DATE



Inshore fishing



1860's - present



Mussel farming



1960's - present



Deep-water fishing



1970's - present



Salmon farming

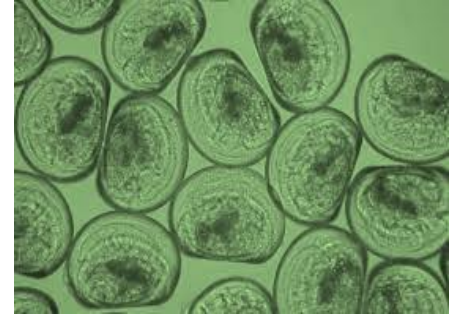


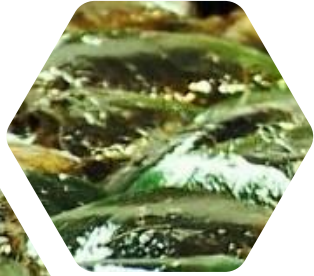
1980's - present

**4 businesses in One**

# LEADING SCIENCE & TECHNOLOGY

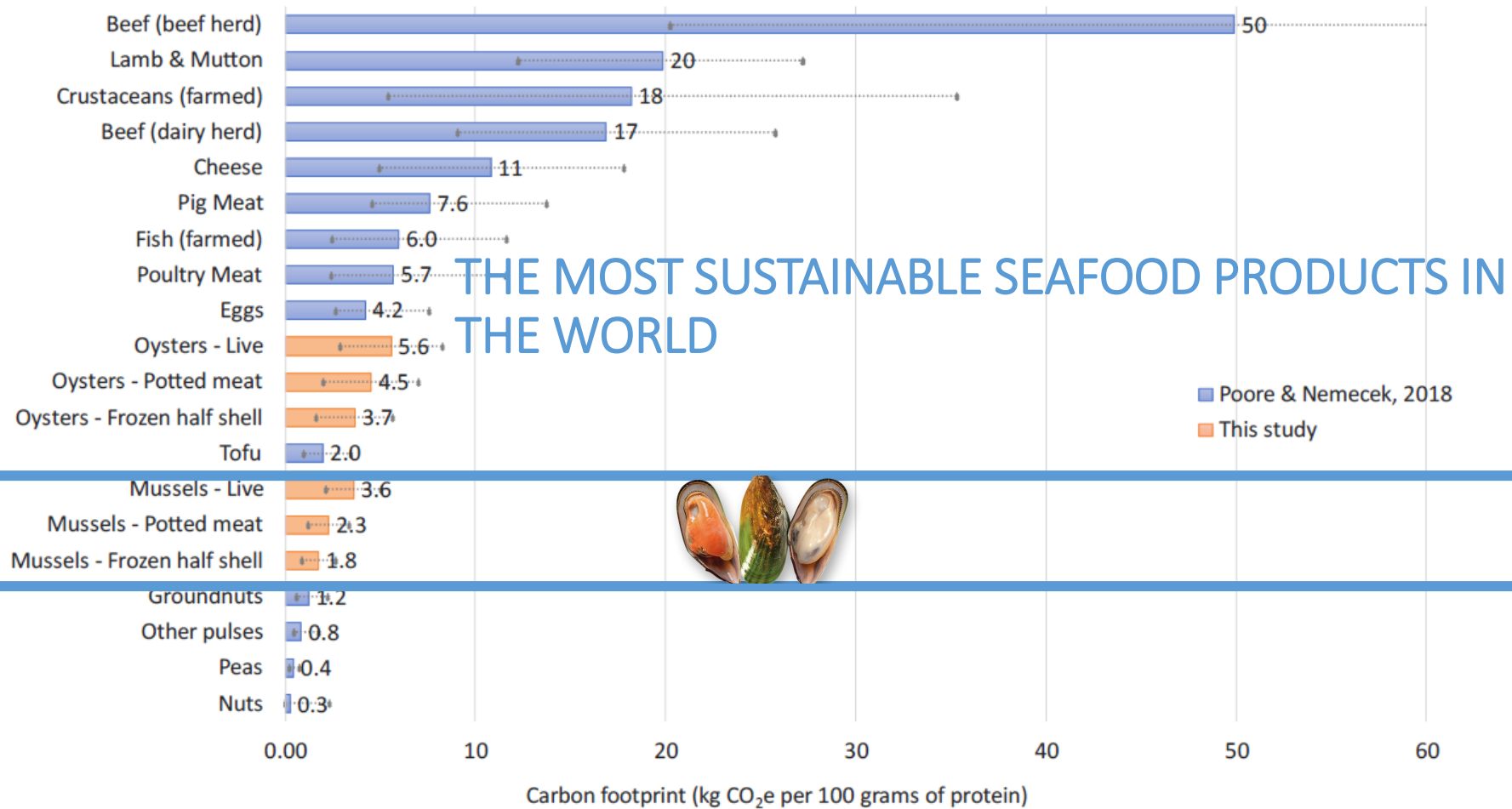
- Improving production efficiency and quality- e.g. PSH
- World-class aquaculture breeding- e.g. SPATnz
- Innovative products- e.g. Collagen nano-fibre extracted from Hoki skin
- Increasing value for Kai Moana- e.g. HVN musseling up



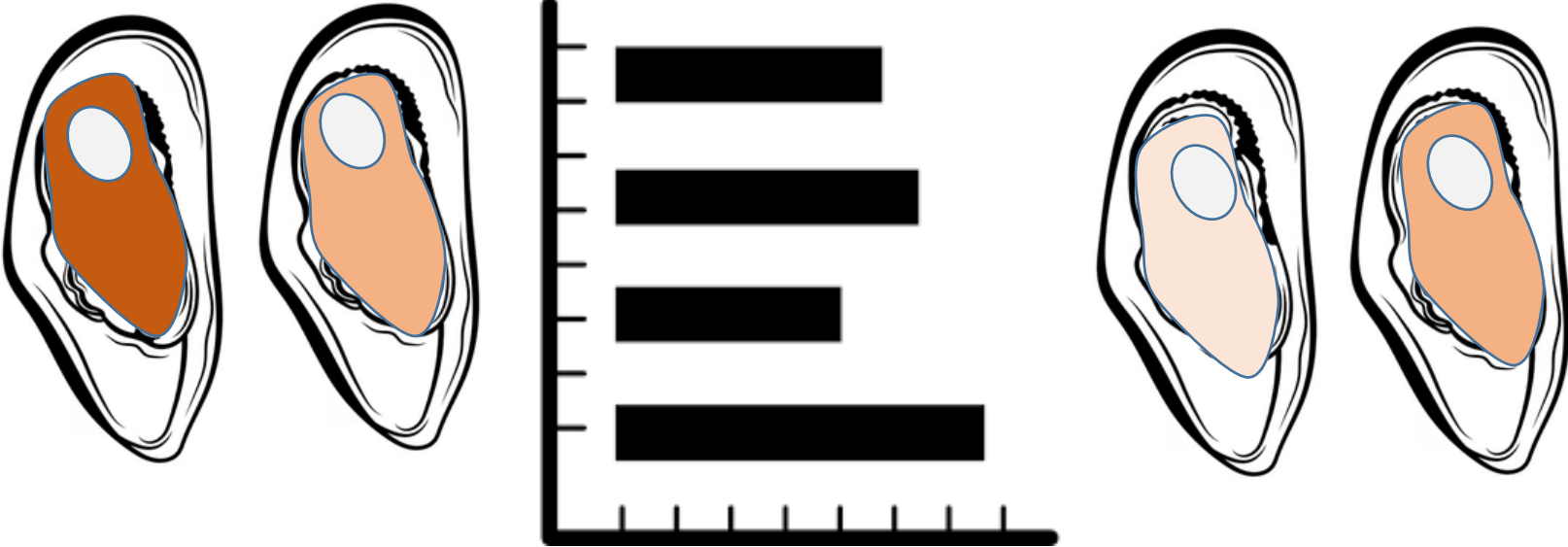


# MUSSELLING **up**

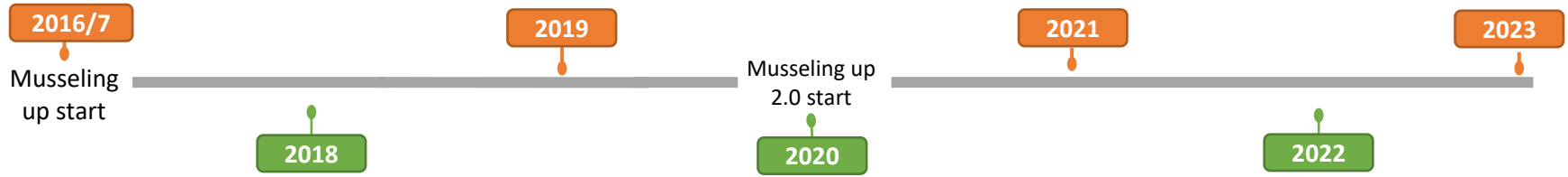




# MUSSEL VARIATION AND BIOACTIVITIES

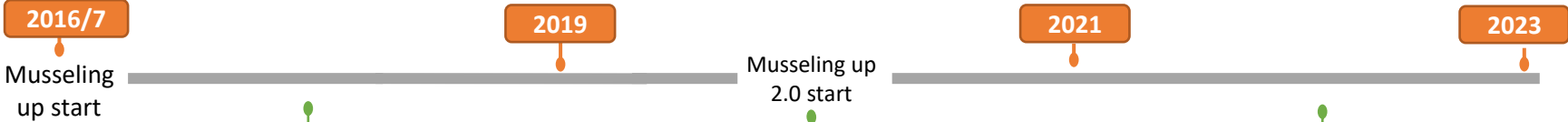


| Season              | 1     | 2     | 3     | 4           | 5      | 6      | 7      | 8      | 9      | 10     | 11     | 12          |
|---------------------|-------|-------|-------|-------------|--------|--------|--------|--------|--------|--------|--------|-------------|
| Nutritional factors | Green | Green | Green | Light Green | Yellow | Orange | Orange | Orange | Orange | Yellow | Yellow | Light Green |





# Evidence for food claims



*In-vitro* studies

*In-vivo* study

Clinical bioavailability

MOVER

MINK

ROAM

# Musseling up 2.0 Clinical trials

## Mussels Optimising Vigorous Exercise & Recovery (MOVER)



## Mussels Improving Nimble Knees (MINK)



## Researching OsteoArthritis and Greenshell Mussels (ROAM)



National  
**SCIENCE**  
Challenges

HIGH-VALUE  
NUTRITION

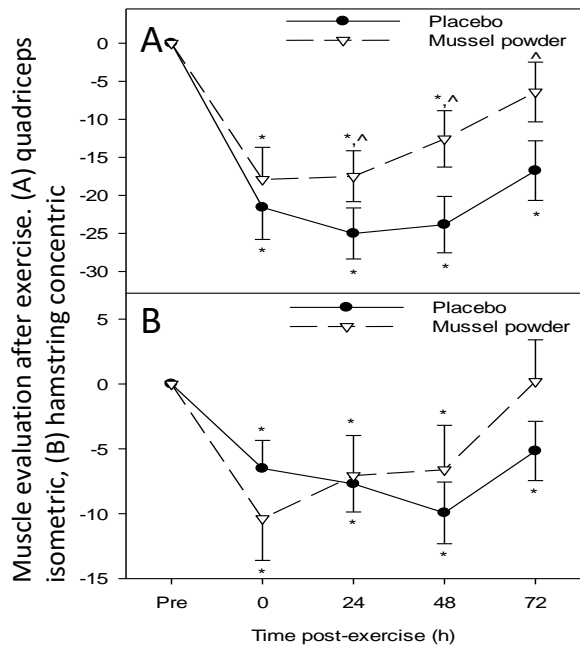
Ko Ngā Kai  
Whai Painga

**MOVER****MINK****ROAM**

|                                | <b>MOVER</b>  | <b>MINK</b>   | <b>ROAM</b>   |
|--------------------------------|---|---|---|
| <b>Purpose</b>                 | To evaluate the effects of GSM on inflammation and recovery following muscle damage.  | To assess the effect of GSM on cartilage biomarker response in healthy postmenopausal women.  | To discern whether GSM can improve both signs and symptoms of OA in those with early/subclinical OA.  |
| <b>Participants</b>            | -20 participants<br>-18-40 years  | -50 participants<br>->55 years<br>-Healthy<br>-BMI >25  | -120 participants<br>-60–74 years<br>-Screened for early stage/subclinical OA   |
| <b>Primary Outcomes</b>        | -Changes in biomarkers of inflammation<br>-Changes in biomarkers of muscle damage<br>-Changes in muscle performance and recovery measures (maximal tension of quadriceps, ratings of muscle soreness and thigh circumference) | -Changes in cartilage biomarkers (CTX-II, CP-II, COMP)<br>- Biomarker discovery using untargeted Metabolomics.<br>-Changes in CTX-I, bone resorption marker.<br>-Changes in body composition.<br>-Changes in inflammatory markers.<br>-Changes in patients reported outcomes: KOOS and VAS questionnaires.<br>- Physical activity | -Changes in cartilage biomarkers (CTX-II, CP-II and COMP)<br>-Changes in inflammatory biomarkers (e.g. cytokines IL-1 $\alpha$ , IL-1 $\beta$ , IL-18, TNF- $\alpha$ ).<br>-Changes in patient reported outcomes: KOOS, ICOAP and VAS questionnaires.<br>-Changes in performance outcome measures: Osteoarthritis Research Society International (OARSI) physical function assessment tests (30sec chair stand test, stair climb test, 40m fast paced walk test). |
| <b>Potential Health Claims</b> | Clinical evidence that GSM helps to reduce inflammation and aids muscle recovery  | Clinical evidence that GSM reduces cartilage damage in metabolic-associated osteoarthritis  | Clinical evidence that GSM can improve both symptoms and functionality for those with early osteoarthritis through a reduction in cartilage damage and inflammation.  |

# MOVER

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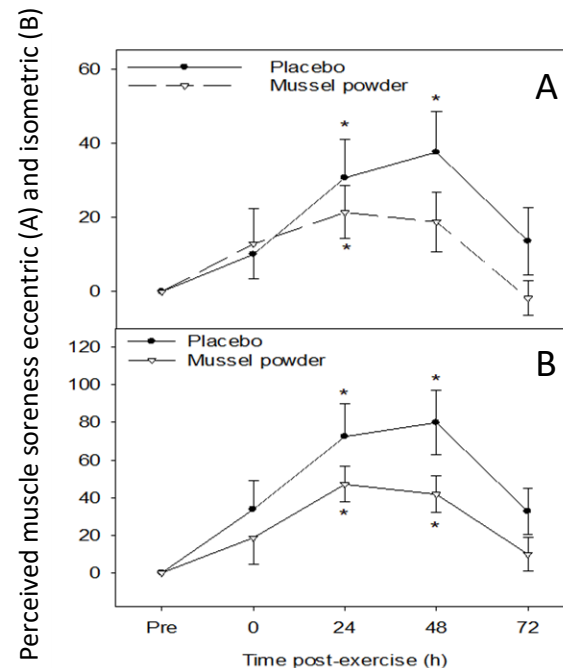
Improved muscle function

- greater loss in muscle function in **placebo**
- faster recovery in **GSM**



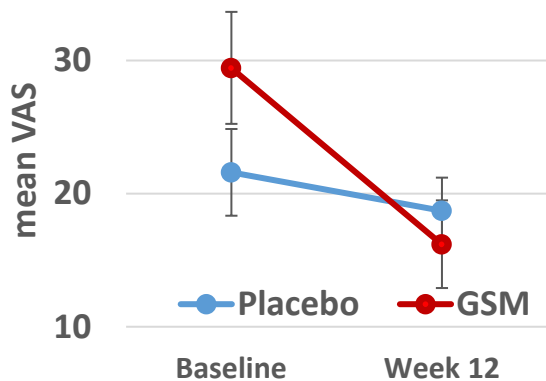
Reduced muscle soreness

- delayed increase in perceived muscle soreness
- returned to pre-exercise levels faster in **GSM**

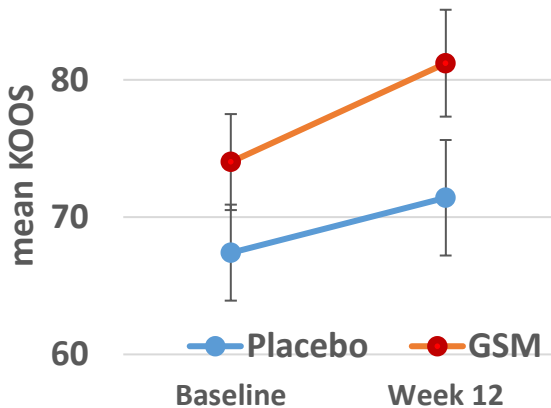


# MINK

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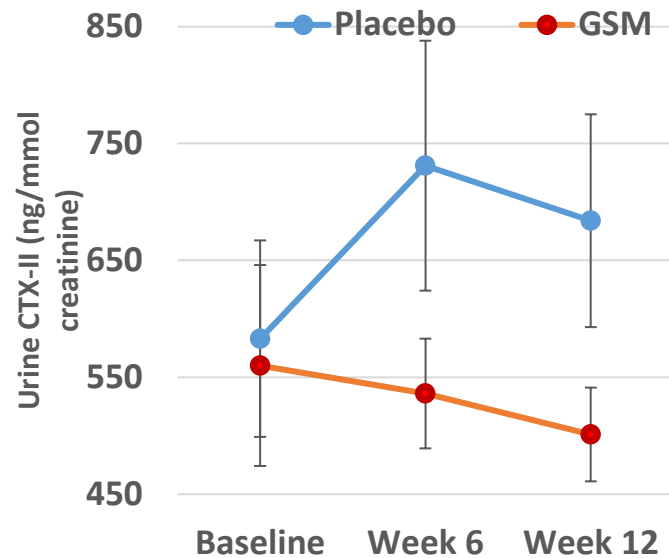
**GSM** had a significant reduction in overall pain score (Visual Analog Scale)



**GSM** had a significant increase in knee joint health and comfort (KOOS)



**MASSEY**  
UNIVERSITY  
TE KUNENGA KI PŪREHUROA  
UNIVERSITY OF NEW ZEALAND



**GSM** participants excreted *less* cartilage breakdown marker CTX-II over time



## **MOVER**

GSM reduced perceived muscle soreness and supported the faster muscle recovery from strenuous exercise by at least 1 day compared with the placebo



## **MINK**

GSM significantly reduced pain, improved knee joint health, and slowed down the degradation of cartilage in older women.  
Placebo had no significant effect



## **ROAM**

Just finished the trial – Data and samples to be analysed

# TRANSLATE SCIENCE TO MARKET



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## Consumer Trends 2021

The now, next, and future global consumer

Wellbeing is **1#** of 7 trends





**SANFORD**  
**BIOACTIVES**





# PRODUCTS FROM THE FUTURE

- Super-premium mussel powder
- Peptides for novel functionality
- Polar and non-polar lipids
- Marine proteins for neurological protection
- Collagen for cosmetics and nutrition
- Marine sourced bio-materials
- Marine materials for biomedical
- Novel marine fractions for wellbeing and disease prevention
- Bioactive standards and research grade materials



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Thank you

