

FFW CRC Project

On-Board Processing and Packaging Innovation in the Australian Wild Harvest Prawn Fishery

*A Presentation to the FFW CRC Industry Connection Hub
September 7 2022*

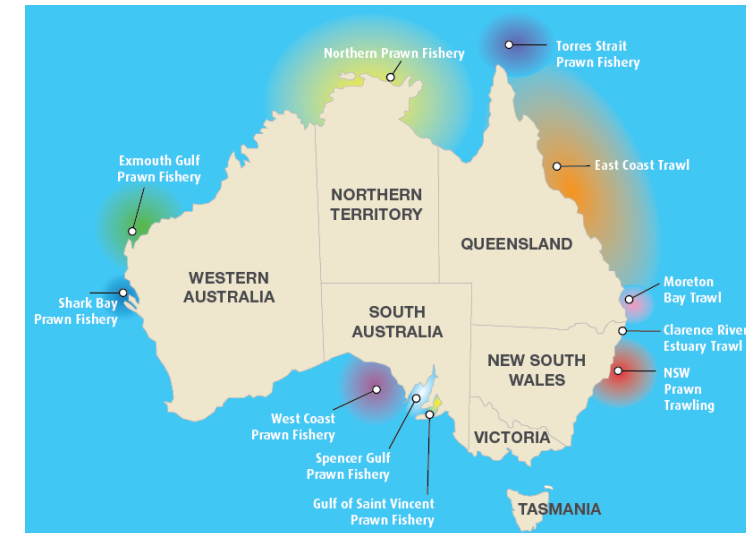
Dr Janet Howieson, Curtin University



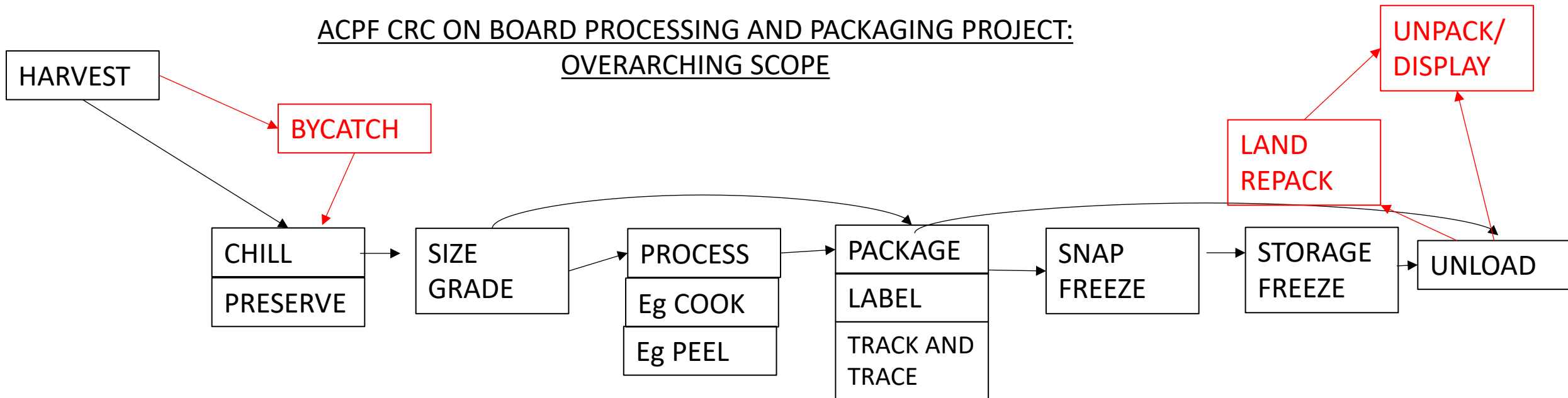
Australian Wild Harvest Prawn Industry

Wild Harvest (Trawl): Value, Volume, ca 17000 tonnes/pa (Varies)

- Multiple fishing areas and species
- Long supply chains and fishing trips
- Mainly Frozen (cooked and green), some Fresh
- Many different size vessels (10-25m) and processes on board
- Different fishery organisational structures
- Australian Council of Prawn Fishers (ACPF) as overarching representative organisation



**ACPF CRC ON BOARD PROCESSING AND PACKAGING PROJECT:
OVERARCHING SCOPE**



Research Area/opportunity	Alternates to Metabisulphite (OH and S; imported issues)	Automation of size grading for better quality/value product.	Better automation of cooking for better quality product. Standardised protocols and Quality parameters for cooked product. Investigate on board peeling and other processing.	Packaging automation, packaging sizes; formats; material; liners; Consumer driven packaging (recyclable etc), labelling to provide consumer information. Digital Traceability (RFID and Bar coding)	Super low temp on board freezers. Standardised protocols and Quality parameters for frozen product.		Digital Traceability (RFID, QR and Bar coding) (software and hardware and whole of chain implementation and evaluation).
Requesting Fishery	All fisheries (potential market access issue & existing ACPF priority)		SB, SG	NPF, SB, SG, NSW & Vic (NPF, SG, SB)	NSW trawl, SG		all

ACPF WASTE CONSIDERATIONS

On Board

1. Product down grading/discard due to poor size grading, damage, quality impact due to slow/unsatisfactory processing times.
2. Bycatch reduction (on board)
3. Crew safety and well being

On Land

1. Repack efficiency/quality control (large to small packaging)
2. Loss on retail display (fresh in supermarkets)
3. Home Consumer loss
4. Food service loss

The Project

Priority Areas of Investigation (and implementation)

Pillar 1: On Board Preservation alternatives

Pillar 2: On board processing and packaging automation

Pillar 3: Packaging innovation (volume, sustainable, fit for purpose)

Pillar 4: Digital through chain traceability



Two Phases

Phase 1 Pre-Feasibility (Technical, Logistical and Economic)

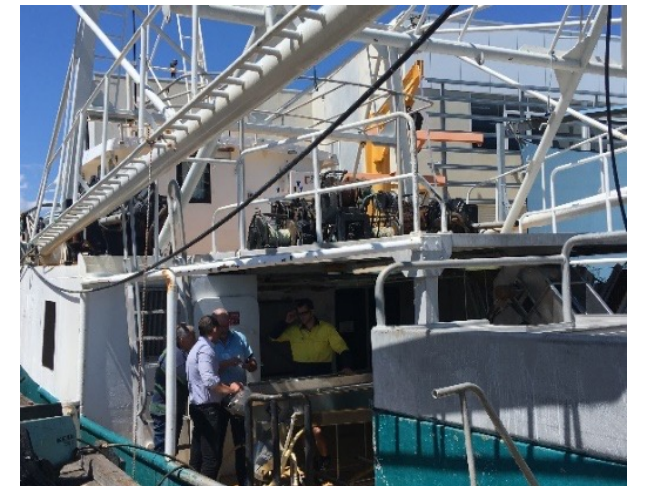
STOP/GO

Phase 2 On board Implementation at Commercial Scale (if necessary by co-funded EoI), Cost benefit analysis and extension.



TO START SEEK INFORMATION AND USE EXPERTS

- A. Detailed literature review (academic and commercial)
- B. Identify expertise and capacity, vessel visits, seek expert advice
- C. Understand market trends to underpin project priorities
(Nielsen: Supermarket purchasing data co-funded).
- Frozen Packaged v Thawed for your convenience
 - Retail Packaging sizes v on board sizes
(and packaging implications)
 - Food Service Packaging preferences?
 - Processed or whole.

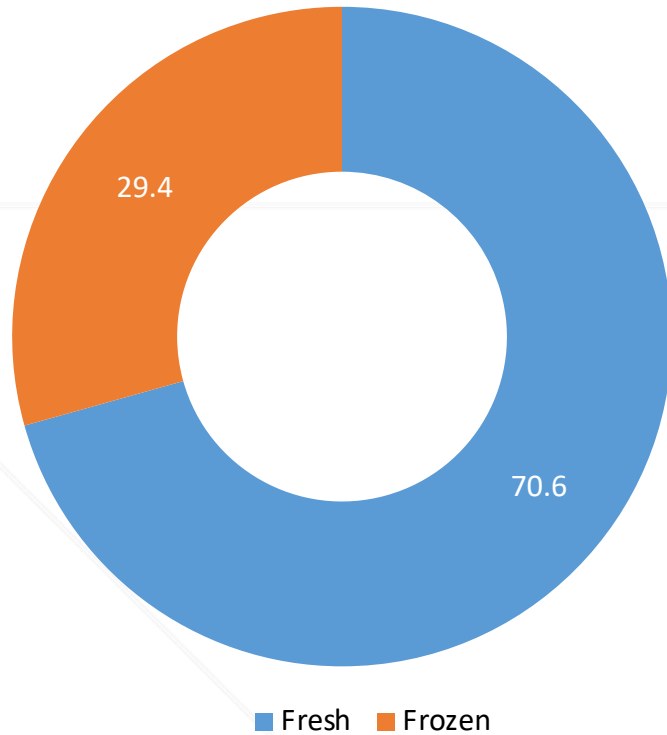


Fish & seafood posted growth in dollar & volume terms. Frozen growth stronger +17.9% vs Year ago

Fresh maintains highest dollar share in the category

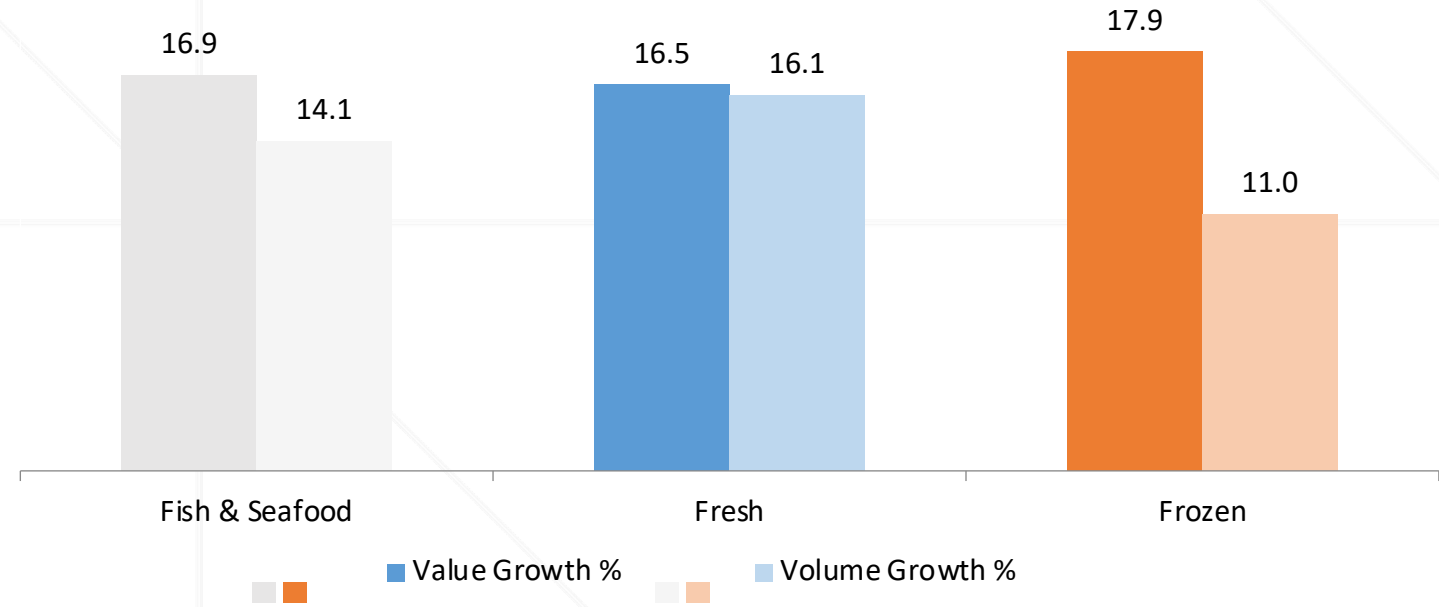
FISH & SEAFOOD | MAT to 31/10/2020

Value % Share



FISH & SEAFOOD | MAT to 31/10/2020 vs YA

Value & Volume Growth %

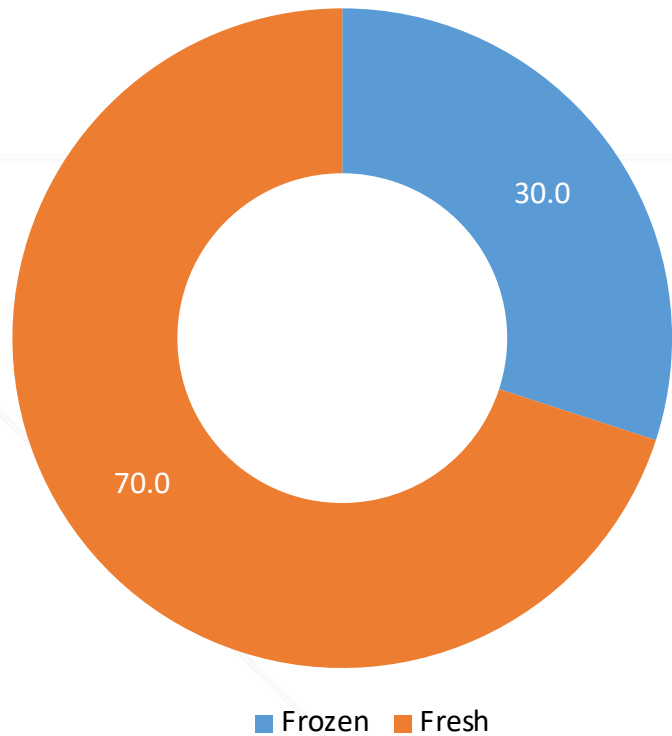


	Value (\$000)		Volume (000)	
	MAT LY	MAT 31/10/20	MAT LY	MAT 31/10/20
T. Fish & Seafood	1,418,786.0	1,658,666.2	67,896.3	77,468.7
T. Fresh	1,005,909.0	1,171,830.7	41,583.6	48,266.2
T. Frozen	412,877.0	486,835.5	26,312.7	29,202.5

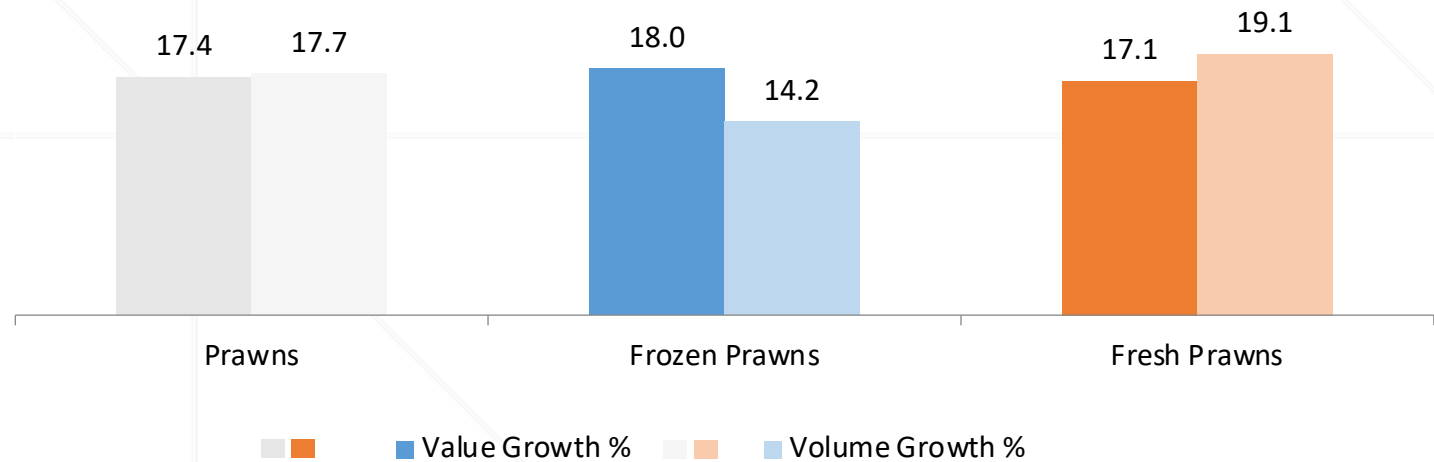
Frozen Prawns leading the growth slightly

Fresh prawns contribute the bulk of the market share. Frozen Prawns share contribution relatively close with total Frozen Fish & Seafood contribution of 29.4%

PRAWNS | MAT to 31/10/2020 vs YA
Value % Share



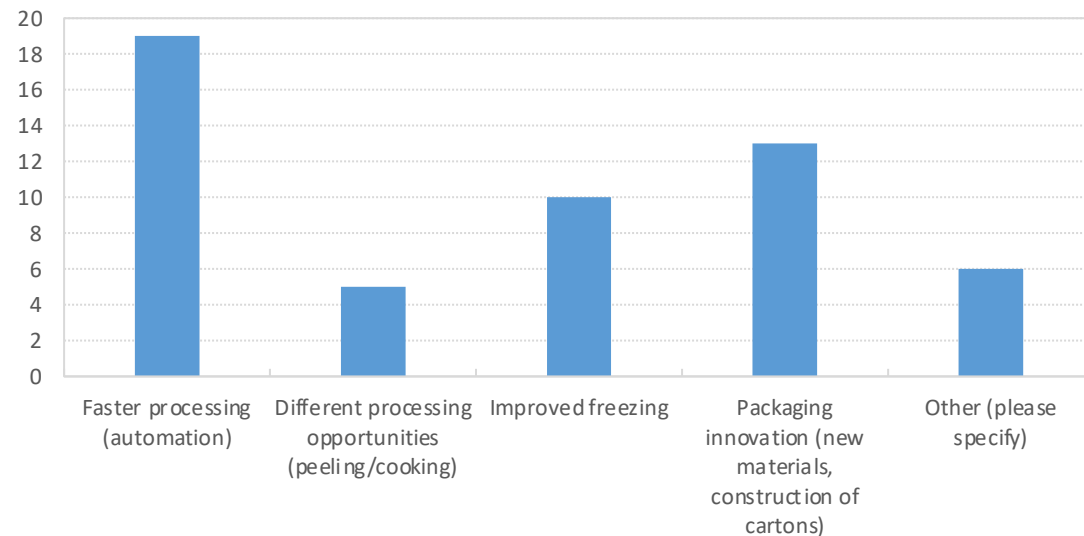
PRAWNS | MAT to 31/10/2020 vs YA
Value & Volume Growth %



	Value (\$000)		Volume (000)	
	MAT LY	MAT 31/10/20	MAT LY	MAT 31/10/20
T.Prawns	292,691.3	343,614.6	11,805.8	13,893.2
T.Fresh	205,331.9	240,512.7	8,393.4	9,997.0
T.Frozen	87,359.4	103,101.9	3,412.4	3,896.2

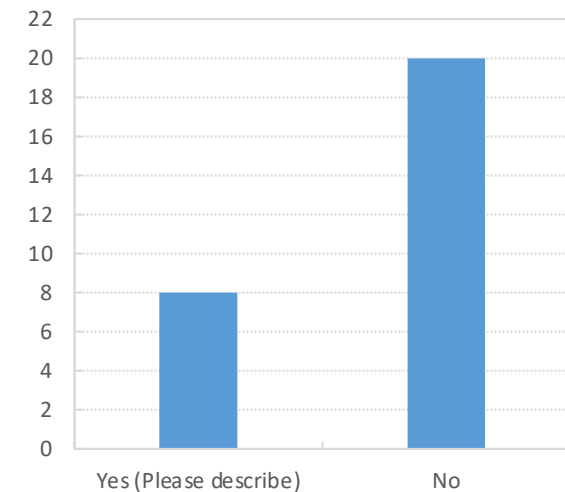
TO START: ACPF Member survey

What opportunities do you think will reduce "post harvest" product loss? (you may select more than 1 answer)



- Change Management of fishery so as not to fish at times of soft prawns or when bycatch of crabs is high.
- Improve grading

Do you have an innovative idea that you would like to implement to improve processing on board?



- tray elevation and small conveyors to aid catch washing and movement past sorting crew - for small boats
- hopper and prawn grader to speed up the processing time
- Improved grading and smaller cartons

PILLAR 1: Preservation Alternatives (Melanosis Prevention)

What is Melanosis and issues with current management

- Alternate Options: academic and commercial
- 4 Hexylresorcinol most commercially effective option (various forms)
- Check regulatory levels

Project Needs

- Develop ability to measure the compound in water and prawn flesh
- Facilitate on board trials (thanks CSIRO scientists).
- Consider Australian Wild harvest prawn Context
 - Recommended dip times and concentrations (feasibility)
 - Cost

On-board trial – Endeavour Day 3

Control



Meta

(16.75 g/L dipped 2 min)



4 H-R (1)

(2.1 g/L dipped 2 min)



4 H-R (2)

(1.25 ml/L dipped 3 min)
25% higher concentration



4 H-R (2)

(1 ml/L dipped 6 min)
Longer dip time at
recommended concentration



On-board trial – Eastern king Day 3

Control



Meta

(16.75 g/L dipped 2 min)



4 H-R (1)

(2.1 g/L dipped 2 min)



4 H-R (2)

(1.25 ml/L dipped 3 min)

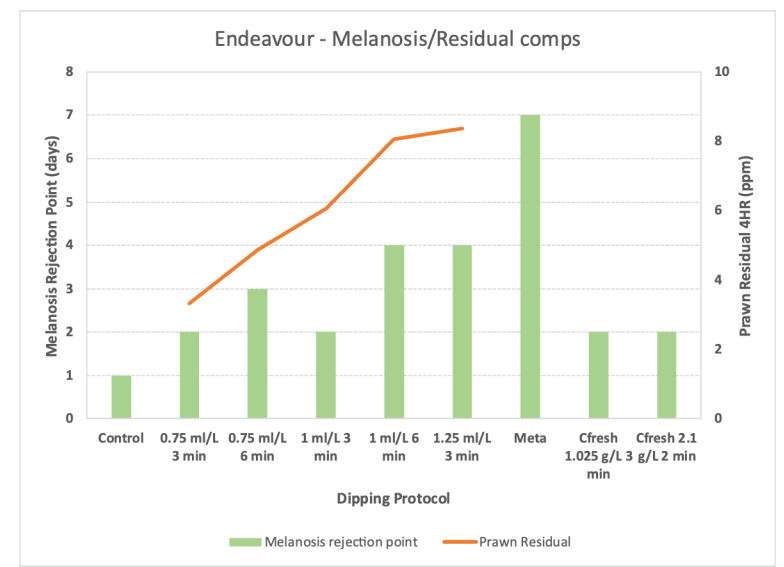
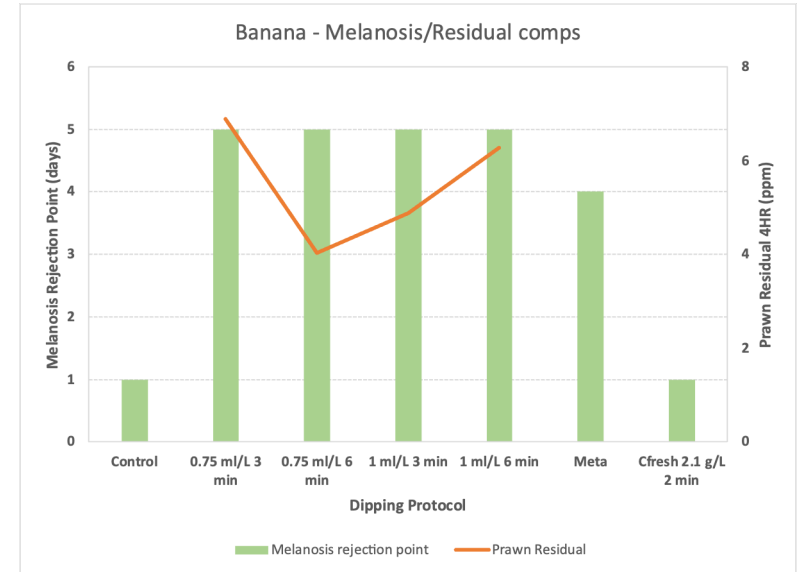


Notes: Meta displayed best inhibition

PrawnFresh at 25% higher concentration displayed comparable results to meta

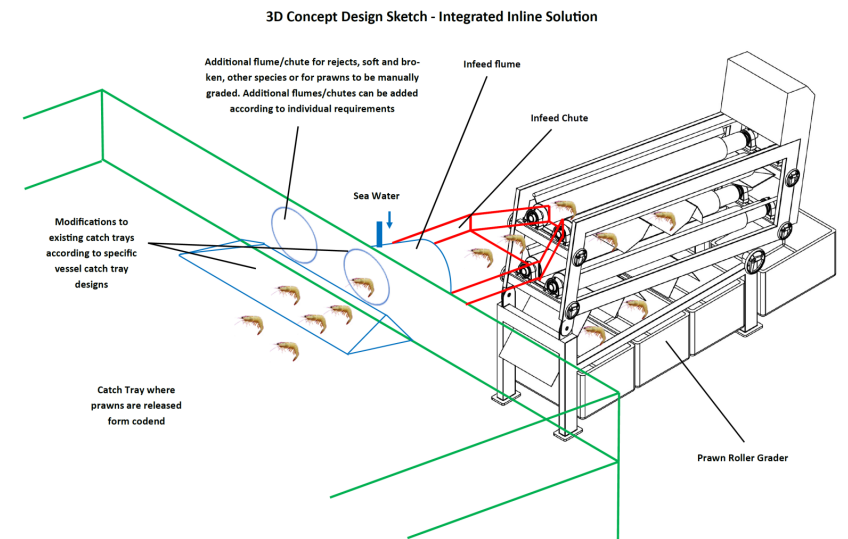
PILLAR 1: Preservation Alternatives: OUTCOMES

- Species Differences and 4 H-R uptake.
- Species Specific Recommendations for dip times and concentrations
- Commercial Implementation and Retail Trials
 - Five vessels in the Northern Prawn Fishery
 - One vessel in Spencer Gulf fishery
- Cost Benefit Analysis



Pillar 2: Automation of On Board Processing and Packaging

- Industry consultation on priorities and multiple expert advice:
- Detailed designs, specifications and costings for five prioritised on board innovations.
- Eol process and letter of agreement.
- Case Vessel Implementation

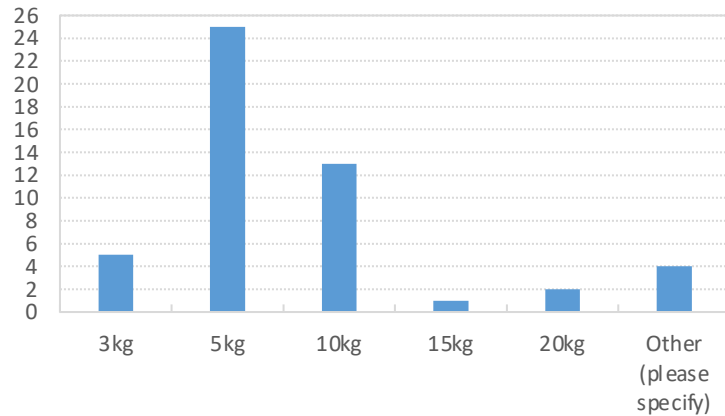


Pillar 2: Automation of Processing and Packaging

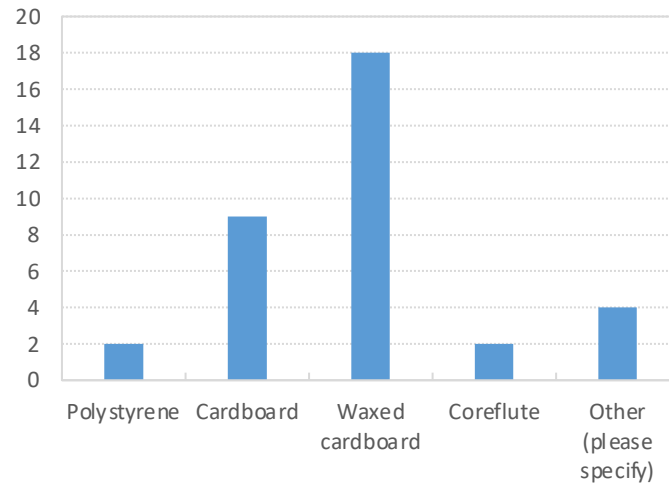
Machine Innovation	Supplier/Designer	Take -Up from Eol
1. Dipping tank reconfiguration in >20m vessels to enhance dipping time and cold chain management during high volume harvest	Austral Fisheries and Cashcor Engineering	Yes, installation complete, trials in progress
2. Automated weighing, packaging system for a range of carton sizes.	KM Fish Machinery, Denmark	No (but alternate offer from company due to fisher interest).
3. Digital scales with grading software for faster manual grading on vessels less than 14m	Peter Bullock Consulting + supplier, eg Macway.	Yes...vessel specific design and costing complete
4. Automated twin roller grader and modified catching tray for vessels longer than 14m.	Peter Bullock Consulting + manufacturer	Yes...(x2) vessel specific design and costing complete, equipment ordered.
5. Automated separation of fish bycatch from prawns.	KM Fish Machinery, Denmark	no

PILLAR 3: Packaging Innovation

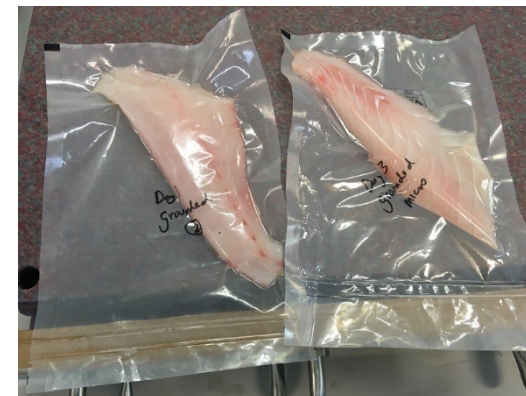
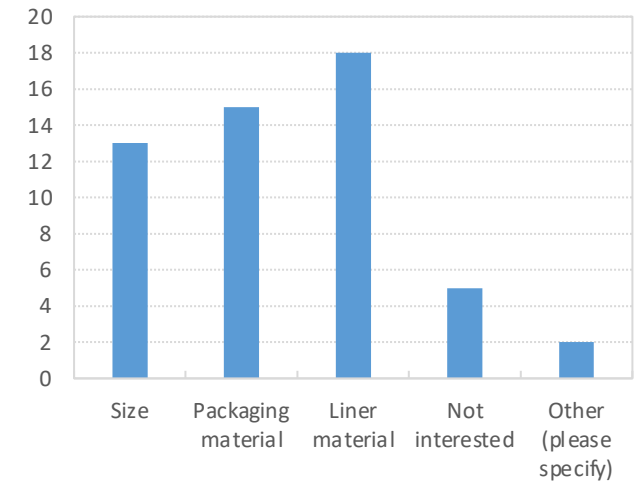
What are the unit sizes of your end product?
(you may select more than 1 answer)



What are your packaging materials made out of? (you may select more than 1 answer)



What different packaging options are you interested in trialling? (you may select more than 1 answer)

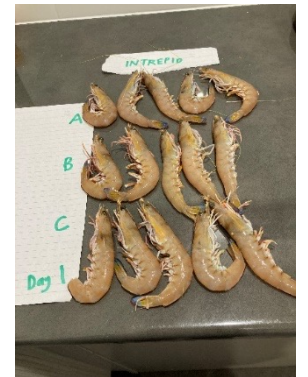


Pillar 3: Sustainable Packaging

AIP completed Evaluation of Options and Suggested Trials.

ACPF members and Curtin work with various packaging suppliers to Trial “fit for purpose” alternate products.

- Cartons (recyclable; re-useable). (Yes Trialled and one Implemented)
- Liners (omit; recyclable; compostable). (Yes ongoing trials)
- Re-Pack Options: recyclable; compostable. (Yes ongoing trials)



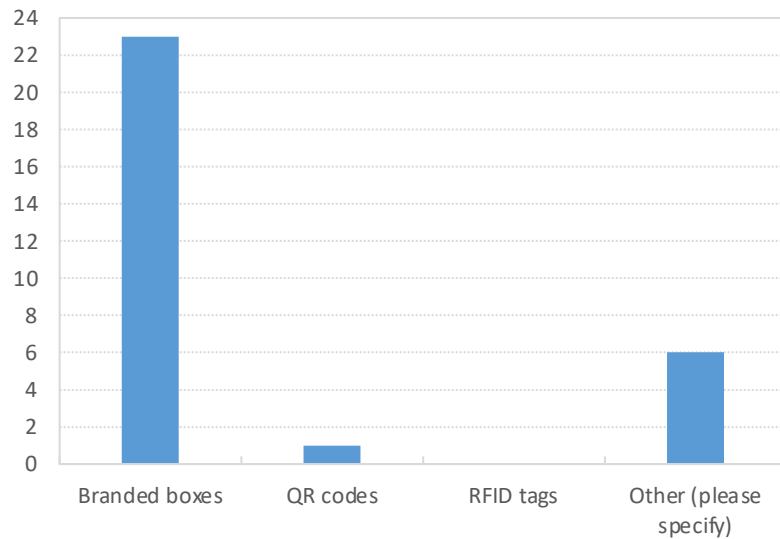
Agreed Parameters

- Rigour on board/land-based and with long term storage (freezers and handling)
- Operational feasibility (eg construction)
- Prawn quality on thaw
- Certification/accreditation/labelling.

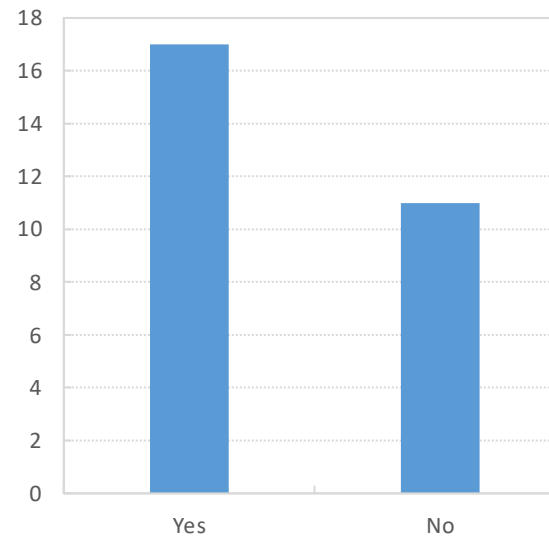


Pillar 4: Digital Traceability

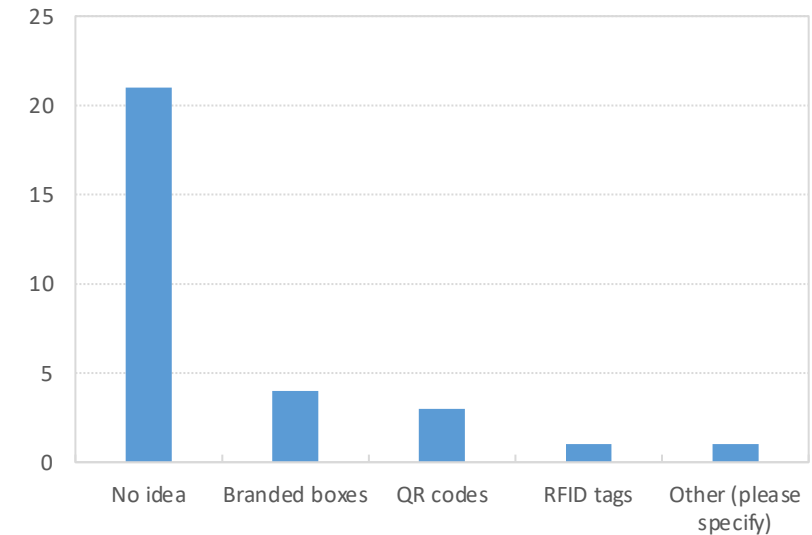
Which of the following traceability systems do you use? (you may select more than 1 answer)



Are you interested in trialling different types of electronic traceability systems?



Do you have any ideas of the types of systems you would like to trial?(you can select more than 1 answer)



[Traceability Chooser: https://quiz.traceabilitychooser.com.au/login](https://quiz.traceabilitychooser.com.au/login)

PROJECT ISSUES FOR CONSIDERATION: HOW CAN WE DO THINGS BETTER

PROGRESS: Was Delayed but original milestone deliverables now almost complete..... Variation now approved.

INDUSTRY PARTICIPATION: Problematic

- a. Extension challenges
- b. Delayed outcomes causes frustration
- c. Industry under significant pressure (economic and market)
- d. Solutions too narrow.

MAINTAINING CURRENCY OF PROJECT ACTIVITIES

NEXT STEPS FOR THE PROJECT

REPORT : ACPF Board and Member Meeting in Sept

INDUSTRY PARTICIPATION: Enhancement Strategies

Improved Co-design of Solutions

Improved Extension

MAINTAINING CURRENCY OF PROJECT ACTIVITIES

THANKS

QUESTIONS/COMMENTS