

The Australian
Prawn Industry
Association



Handling Prawns At Sea

A Guide for
Prawn Trawler
Crew
at Level 1

by Grant Carnie
Australian Fisheries Academy

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Learning Guide

Handling Prawns at Sea
A Guide for Prawn Trawler Skippers and Crew at Advanced Level
by Grant Carnie, Australian Fisheries Academy
Principal Investigator Phillip Walsh

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INTRODUCTION TO THIS LEARNING GUIDE

This Learning Guide, *Handling Prawns at Sea – A Guide for Prawn Trawler Crew at Level 1*, will assist you as a new crew member to develop competence in handling prawns on board a trawler.

This Learning Guide deals with the skills and knowledge required to correctly handle prawns from the time they land on board, through the various handling procedures up to the time the prawns are unloaded from the vessel.

This Learning Guide is designed to be used either during a formal training session or as a learning aid for a crew member who is already working on a trawler and is learning on the job. At the end of training the crew member should be able to:

- apply safe hygiene practices when handling prawns
- prepare the sorting area for correctly handling prawns landed on board
- sort, grade and wash prawns in accordance with vessel, company and industry standards
- dip prawns in a way that follows the requirements of the product used, meets the regulatory level for the particular market and is in line with vessel, company and industry standards
- cook prawns so that they are hygienically handled and adequately cooked
- handle prawns for storage in chilled water or brine
- pack and weigh prawns in accordance with vessel, company and industry requirements and standards
- handle prawns for correct and safe freezing and storage on board a prawn trawler
- unload prawns so that the correct temperature and quality is maintained.

WHO CAN USE THIS LEARNING GUIDE

This Learning Guide is mainly designed to develop the skills and knowledge required by learners to work effectively in the prawn industry. Learners may be trainees, senior secondary and post-secondary students, existing workers or those looking for employment in the industry. Trainers, coaches and assessors can also use this Learning Guide to support training and assessment, both on and off the job.

LEARNER

As a learner, you can use this Learning Guide to:

- study at your own pace
- review topics covered by your trainer or coach
- prepare for assessment.

TRAINER OR COACH

Your trainer or coach can use this Guide to:

- plan and deliver your training
- provide you with additional information
- set practical activities for your workplace training
- keep a record of the training that you have done.

ASSESSOR

Assessors may also use this Guide to:

- plan your assessment
- show you where you need to improve
- keep a record of the evidence used in your assessment.

HOW TO USE THIS LEARNING GUIDE

- Read through this Learning Guide carefully. It is divided into topics that cover all the skills and knowledge you need to successfully become competent in handling prawns on a prawn trawler.
- Talk to your trainer and agree on how you will both organise your training
- Work through all the information in each topic. If your training is off the job, you may use this Learning Guide as a study guide and companion for materials delivered in classroom-style sessions.
- Ask for help when you need it. It is probable your trainer will also be your supervisor or skipper. They will support you and show you the correct way to do things. Talk to more experienced colleagues and ask for their guidance too.
- Listen, take notes, ask questions and practise your new skills on the job or in a simulated workplace environment. Make sure you practise your new skills regularly. That way you will improve both your confidence and performance.
- Throughout this Learning Guide you may see these symbols. This is what they mean:

Danger



Danger! You could get hurt.

Remember



Remember this! It is important.

- Use the self check questions at the end of each section to check your own progress.
- When you are ready, ask your trainer to watch you perform the tasks outlined in this Learning Guide, and ask for feedback on your progress.

BASIC HYGIENE PRACTICES

FOOD HANDLING AND STORAGE

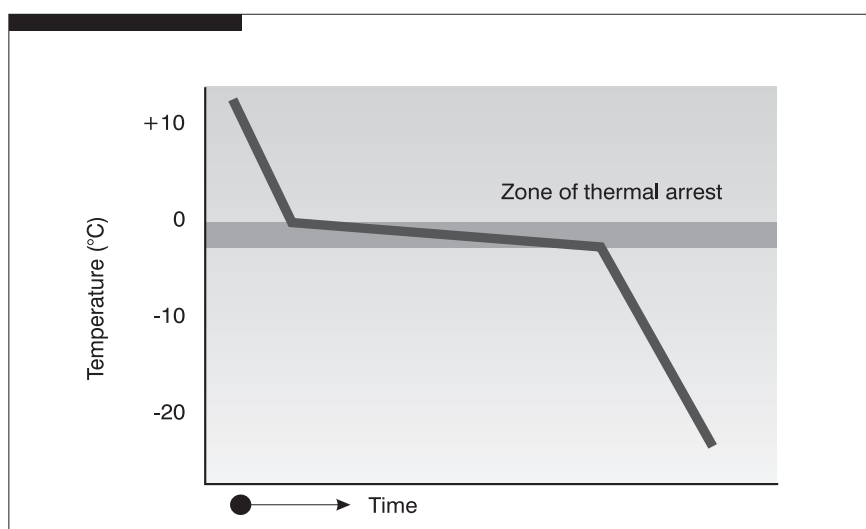
When any fish or animal dies it begins to deteriorate immediately. Correct handling and storage is critical to prevent the product from 'going off' (spoiling) or becoming harmful to eat. Prawns begin to deteriorate the moment they land on board a trawler, and in fact if they die in the net through long trawling times, they start to deteriorate even before they land on board.

The main reasons prawns start to deteriorate are:

- temperature, and
- bacteria.

Temperature

Controlling the temperature of prawns is very important. Prawns spoil by the action of enzymes in the prawn, by bacteria naturally living on the prawn, and by bacteria picked up by the prawn during landing and sorting. After death enzymes start to break down the flesh, which also creates a food source for bacteria, finally resulting in spoilage of the prawn. This breakdown of prawns can be slowed by chilling or freezing, and the colder the product the slower the breakdown. Rapid chilling or freezing reduces the growth of bacteria.



Bacteria

Bacteria are single-cell organisms that multiply rapidly in the right conditions and may double in numbers every hour. 100 bacteria could become:

- 1600 after 4 hours
- 25,600 after 8 hours
- 409,600 after 12 hours
- 6,553,600 after 16 hours.

They need *warmth, moisture, food* and *time* to grow. Most spoilage bacteria also need air (oxygen) but some, particularly poisonous bacteria, can grow in the absence of oxygen.

The longer any food product, including prawns, is left in temperatures above 4°C the more the bacteria will start to multiply. After a period the bacteria levels may be so high that the prawn is 'off'. Cooking or chilling the product will not make it edible.

Some bacteria are harmful in large numbers whilst others produce toxins (poisons) when they grow. The prawn may not smell or taste off, and many of the toxins are not destroyed by cooking. This is what makes people sick and it can even be fatal.

There are four important rules for maximising the quality of prawns on board a trawler:

- ✓ *Catch, land and process prawns as quickly and gently as possible.*
- ✓ *Lower their temperature as quickly as possible.*
- ✓ *Maintain the low temperature at all times.*
- ✓ *Follow proper personal, workplace and product hygiene practices.*

PERSONAL, WORKPLACE AND PRODUCT HYGIENE

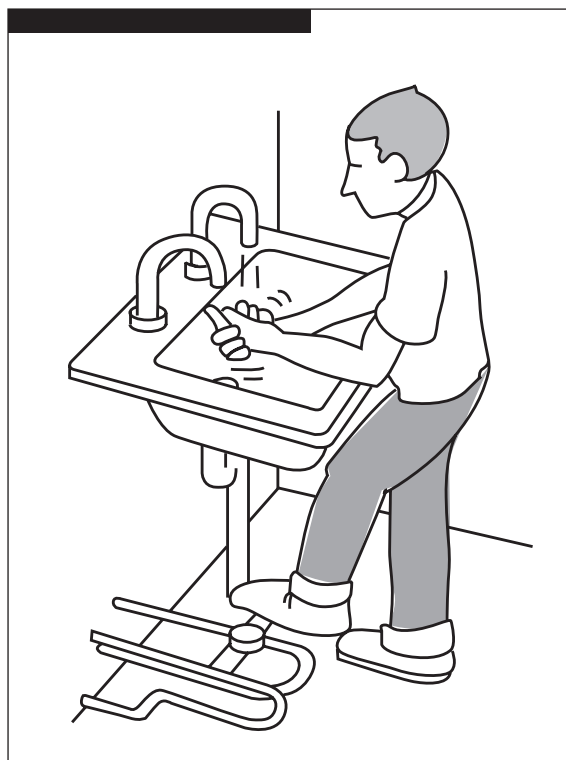
Good hygiene on board a prawn trawler is extremely important to protect the prawns from contamination. This means people (personnel) and any cleaning tools, decks, chilling tanks, freezer areas, prawn baskets, cartons and grading or processing machinery that may come into contact with the product.

Good detergents are necessary to remove proteins, fat, slime, and blood while sanitisers are necessary to kill bacteria, moulds and viruses.

The following is a list of measures you can take to help prevent product contamination.

Personal hygiene

- Clean wet-weather gear, clothing and gloves thoroughly after use.
- Wash your hands with soap and water before starting work and after using the toilet.
- Avoid touching your hair, nose, mouth, ears and eyes while handling the product.
- Keep cuts and sores well covered with a waterproof dressing.
- Do not smoke while working.



Workplace hygiene

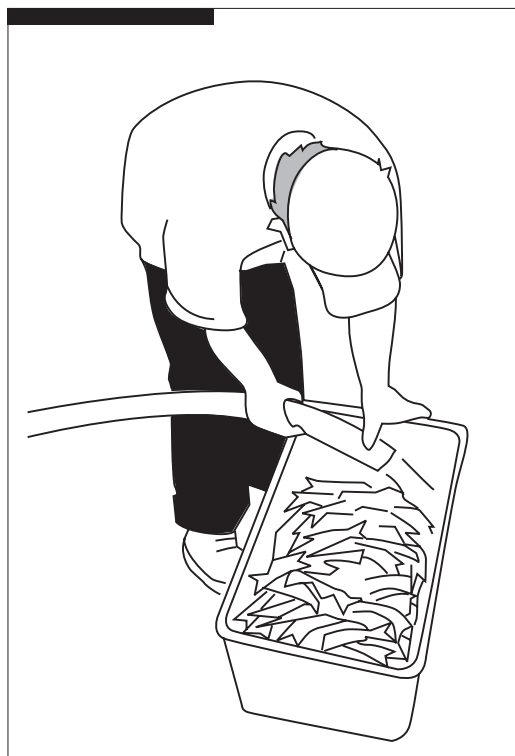
- Wash and hose down decks with sea water after each haul. Scrub them with a good detergent at the end of each day, and after unloading.
- Keep knives, brushes, shovels and rakes free of rust; wash and sanitise them after use.
- Store cardboard cartons and plastic liners in a clean dry place free of insects and rodents.
- Ensure prawn baskets, netting bags, tubs, etc., are clean before use and thoroughly scrub and sanitise them after use.
- Scrub snap rooms, freezer rooms, cookers and refrigerated sea water tanks with detergent and sanitise them after use.
- Flush and sanitise refrigerated sea water tank pipe work after use.
- Wash and sanitise sorting tables, automatic grading machines, packing tables and processing equipment after use and sanitise them again before use.
- Keep toilets in a clean condition.



Check with your skipper or supervisor about the standards required on your vessel.

Product hygiene

- Wash prawns thoroughly in clean sea water as soon as they are sorted.
- Do not mix up the new catch with any old catch that has not been processed.
- If you are cooking prawns, chill them quickly after they are cooked.
- Monitor and keep the product at a constant low temperature.
- Between handling cooked and raw prawns take appropriate actions, such as washing hands and changing gloves.



WASHING PROCEDURES

A proper cleaning and sanitising process is essential to prevent the spread of bacteria. Without clean surfaces there is always the risk of contamination.

Cleaning programs often fail because:

- cleaning methods are not effective
- crew do not know how to clean properly
- cleaning tools or chemicals are not suitable.

Steps in proper cleaning

Step	Description
1. Remove loose dirt	Brushing or hosing surfaces, baskets, etc., removes dirt and reduces chemical use.
2. Wash	Use detergents to help break down fats and grease. Washing does not necessarily remove all bacteria.
3. Sanitise	Reduce bacteria to low levels using sanitising chemicals or very hot water (70°C – 80°C). Follow sanitiser instructions as there may be a minimum contact time for effectiveness and the sanitiser may need to be rinsed off afterwards.
4. Dry	Bacteria love water, so drying prevents them from growing or being transferred between wet surfaces.

Ensure the tools you use are adequate for the job. For instance, make sure the deck hose has sufficient pressure to remove dirt/rinse, brushes are clean and complete, and chemicals are used in sufficient quantities.

A typical cleaning schedule

Before trawling

- Ensure all sorting tables, tanks, baskets and buckets are cleaned, sanitised and rinsed with clean water.
- Always follow the manufacturer's instructions for the use of cleaning chemicals.

After each trawl

- After each shot has been processed the deck area should be hosed down and any foreign matter, such as dead fish or weed, removed.
- All sorting tables need to be rinsed clean of prawn juice and foreign matter.

After each unload

- Clean and sanitise all equipment so it is ready for the next day's trawling.
- Clean all toilets, hand basins and other crew amenities and replace soap, towels, nailbrushes, etc., as required.

Material Safety Data Sheets should be kept on board.

Ask your trainer or skipper to show you one and make sure you know how to handle chemicals safely.

MATERIAL SAFETY DATA SHEET (Sample only)	
<i>The following information should be included:</i>	
Company: _____	
Address: _____	
Phone No: _____	
Emergency phone No: _____	
IDENTIFICATION	
Product name: _____	UN number: _____
Other names: _____	Hazchem code: _____
Dangerous good class and subsidiary risk: _____	
Manufacturer's code: _____	Poisons schedule: _____
Use: _____	(Major uses and methods of application).
Physical description/properties (appearance, boiling point/melting point, vapour pressure, specific gravity, flash point, flammability limits, solubility in water): _____ _____	
Other properties: _____	
Ingredients (includes all hazardous chemicals): _____	
Chemical entity CAS number: _____ Proportion: _____	
HEALTH HAZARD INFORMATION	
Health effects (including data on both acute (short term) and chronic (long term) exposures): _____	
Acute:	Swallowed: _____
	Eye: _____
	Skin: _____
	Inhaled: _____
Chronic:	
First Aid	Swallowed: _____
	Eye: _____
	Skin: _____
	Inhaled: _____
Advice to Doctor (emergency treatment): _____ _____	





SELF CHECK

	YES	NO
Do you understand why it is important to keep prawns chilled or frozen?		
Can you describe four important rules for maximising the quality of prawns?		
Can you follow basic hygiene practices to prevent contamination of the product?		
Can you take the necessary measures to ensure proper cleaning?		
Can you prepare a typical cleaning schedule on a prawn trawler?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.



PREPARING THE SORTING AREA

CLEANING

A common mistake that crew members make is to fail to clean the sorting table, processing tables, tanks, baskets and other equipment used for processing before they begin fishing. They assume that because everything was cleaned at the end of the previous day/night's fishing, recleaning and sanitising is unnecessary.

Remember



You have been at anchor or perhaps in port in between. The equipment has had all day to gather new dirt, dust, bacteria and other matter that could contaminate the product.

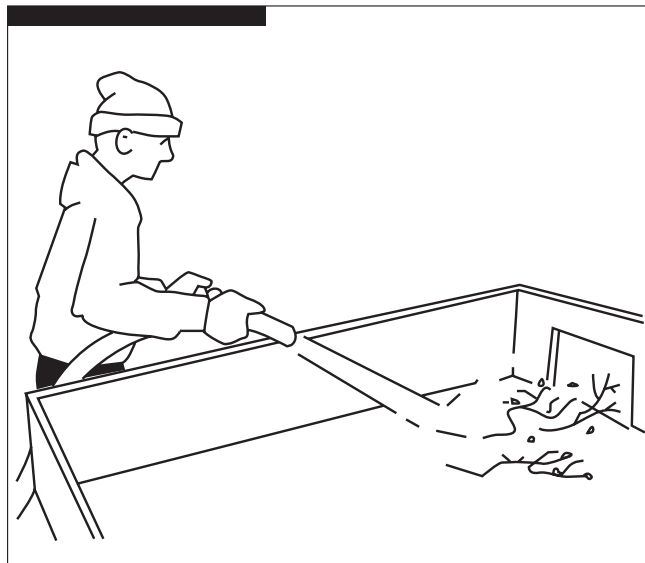
Cleaning before trawling

After you have shot the gear away for the new day/night's trawling, it is an ideal time to reclean and sanitise all related areas and equipment. Follow the procedures referred to in the previous topic, *Basic Hygiene Practices*:

- ✓ *Wash all areas and equipment thoroughly.*
- ✓ *Sanitise.*
- ✓ *Rinse all areas and equipment well with clean water.*

After each trawl

Make sure the deck area is hosed down after each shot and wash foreign matter such as weed and dead fish overboard. Rinse the sorting table and processing table with clean water to get rid of prawn juices and foreign matter.



Everything is now ready for the next shot of prawns to be emptied onto the sorting table and processing to begin again.

SEPARATING A PREVIOUS SHOT

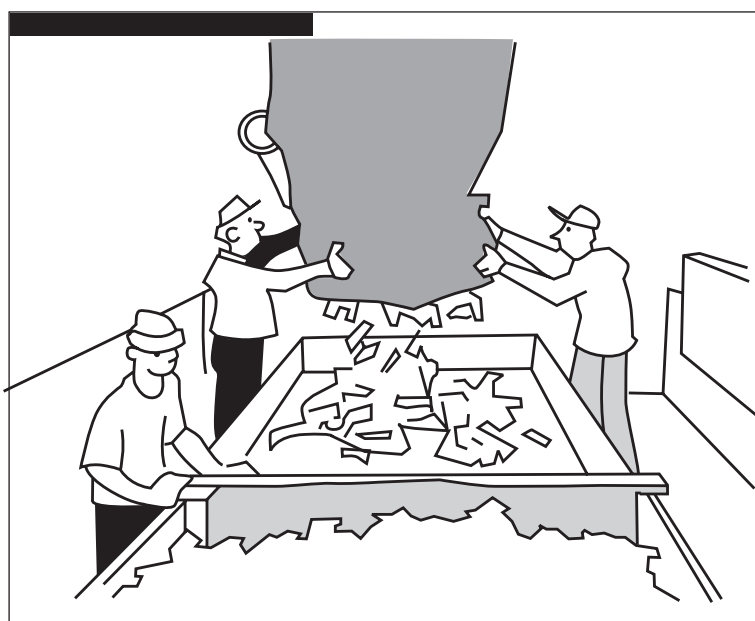
During busy fishing periods it may be necessary for the skipper to haul the gear and empty the codends before the crew have managed to clear the sorting table of the previous shot.

It is essential that unsorted prawns be separated from the newly landed catch. Dumping a new catch of prawns on top of unsorted prawns means the previous shot will be sorted last and exposed for a considerable time, dramatically increasing the risk of spoilage.

The weight of the new catch is likely to cause the prawns from the previous catch to become soft, damaged and bring a lower price.

If you have to empty a new shot before the last shot has been completely sorted, you must separate the old shot so you can get to them first and clear them as quickly as possible. Ways to do this could include:

- pushing the unsorted catch to one end of the sorting table and placing a 'pound' or division board between the previous catch and where the new shot will be landed
- carefully pushing the unsorted catch into a basket or baskets and then returning it to the sorting table once the new shot is emptied.



Remember



- Contamination can take place because areas and equipment were not recleaned.
- The quality of the product will suffer if prawns are allowed to spend too long on the sorting table.



SELF CHECK

	YES	NO
Do you know when sorting areas should be cleaned?		
Do you understand why it is important to separate unsorted prawns from an earlier shot from a newly landed shot?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.



SORTING, GRADING AND WASHING PRAWNS

When prawns, bycatch and other matter have been emptied onto the sorting table (or sorting area), the catch needs to be sorted to separate the prawns from everything else, perhaps size graded and then thoroughly washed.

It is absolutely essential that these tasks be carried out properly. The quality of the product you produce determines the reputation of your trawler and hence, what price you will receive when you sell your product. Buyers want to know that the product they have bought contains only prawns and that the size range and quality of each prawn is as promised.

SORTING

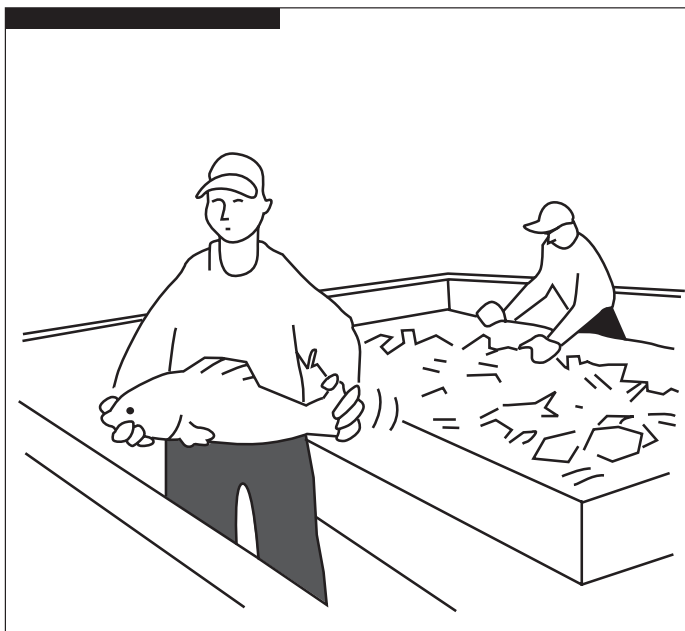
The first task is to sort the prawns. Many trawlers now have semi-automatic sorters called hoppers. These separate much of the bycatch and other matter, so the catch only needs to be hand sorted to separate species and defective prawns. Let us assume that the boat you work on (or intend to work on) does not have a hopper.

Sorting can involve three separate tasks:

- Sorting prawns from incidental catch and returning bycatch to the sea
- Separating the catch into species of prawns if you are in a fishery that catches multi-species together
- Separating the soft, broken and other defective prawns from the good quality prawns.

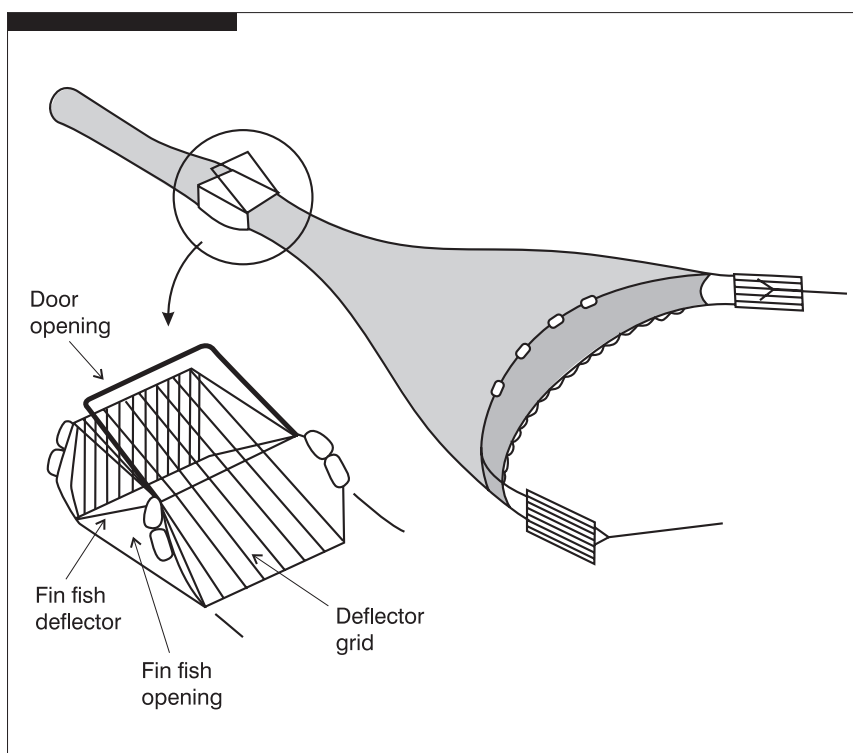
Many vessels now use bycatch reduction devices in the net to allow larger bycatch to escape and mesh grids and other devices over the sorting table to separate some bycatch and allow it to be easily sorted.

Any incidental bycatch (non-target species of fish) must be returned to the sea as soon as possible.

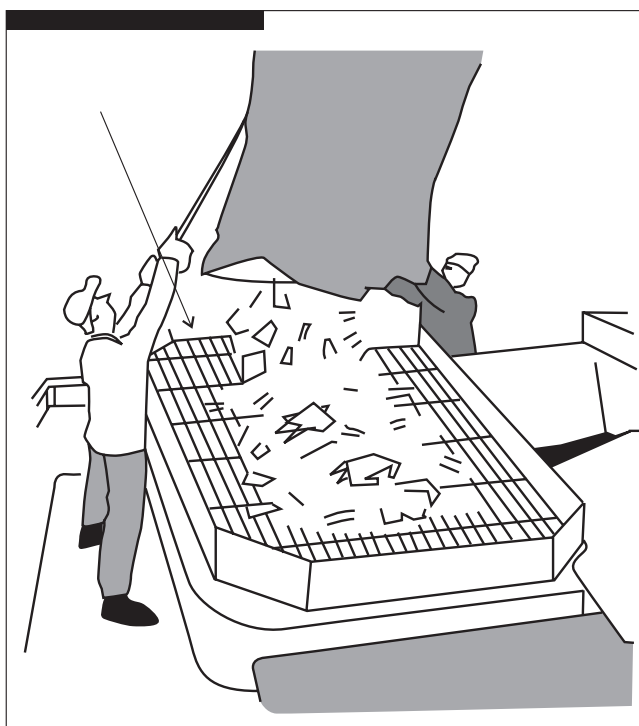


Return bycatch to the sea as soon as possible

This increases their chance of survival. It particularly applies to catch that regulations don't allow you to keep. Check with your skipper and the crew which bycatch you are allowed to keep in your fishery.



Many of Australia's prawn fisheries catch more than one species of prawn at a time. These will probably need to be separated unless you are selling bulk packs for further processing in a shore-based establishment and the buyer does not require sorting by species.



Prawns can have a range of defects and these need to be identified so that defective prawns can be separated from good quality prawns. Defective prawns can then be sold separately as 'soft and broken'.

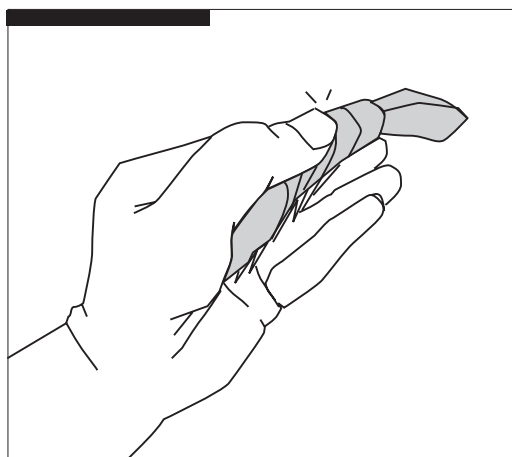
Make sure you know the species of prawns caught in your area and are able to identify the differences between species.

Some typical defects that occur are:

Soft shell

The prawn is soft to touch, particularly the shell. To test whether the prawn shell is soft:

- Place the last body segment before the tail between the thumb and forefinger and press down on the ridge.
- If the shell is firm or depresses but springs back to its original shape on releasing pressure, the prawn is OK.
- If the shell remains depressed, soft or crumbles the prawn is defective.

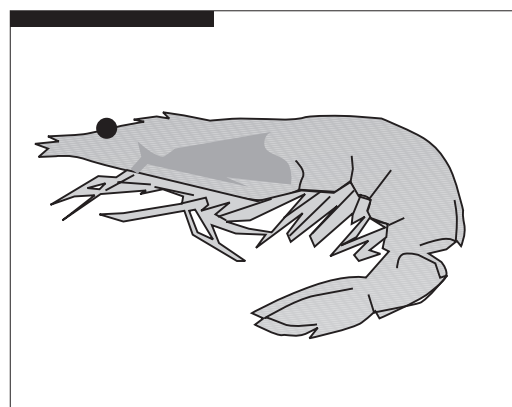


Loose head

- If the membrane attaching the head to the main body of the prawn is broken and the head droops at more than 45° angle the prawn is defective.
- A dropped head where the membrane remains attached but may be stretched and the head droops at less than a 45° angle is not a defect.

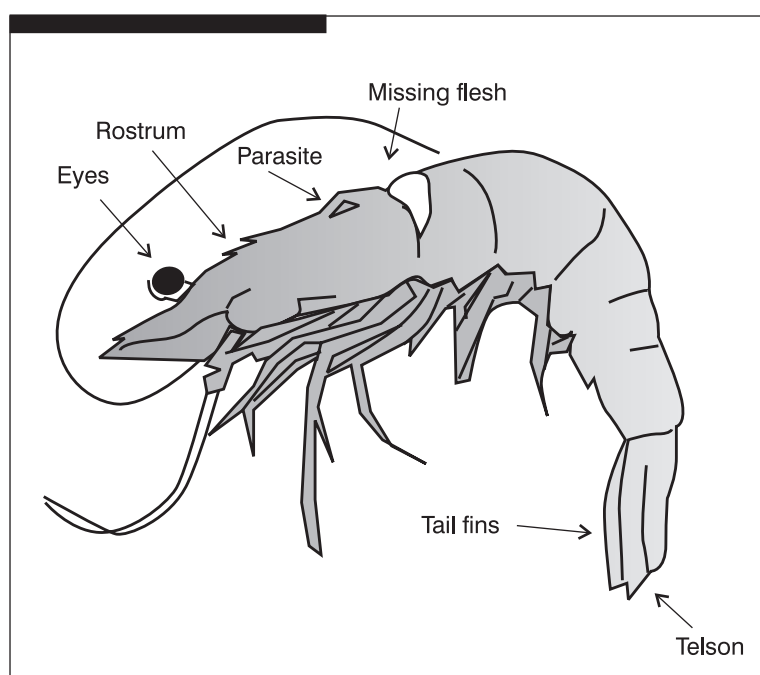
Broken and damaged prawns

Prawns can be damaged in a number of ways – from small injury marks on the shell to crushed heads and broken bodies. These defects can be caused by bites from other species such as crabs, or from heavy matter such as rocks or other parts of the sea bed that may have been lifted with the net.



Examples of defects to look for include:

- prawn shell separated from the flesh and the flesh is damaged
- prawn is missing the telson and tail fins
- cuts through the shell into the body exposing the flesh
- rostrum and eyes missing.



Parasites

Parasites in prawns are defects, however if the parasites are removed without damage, the prawn is not defective.

Diseased product

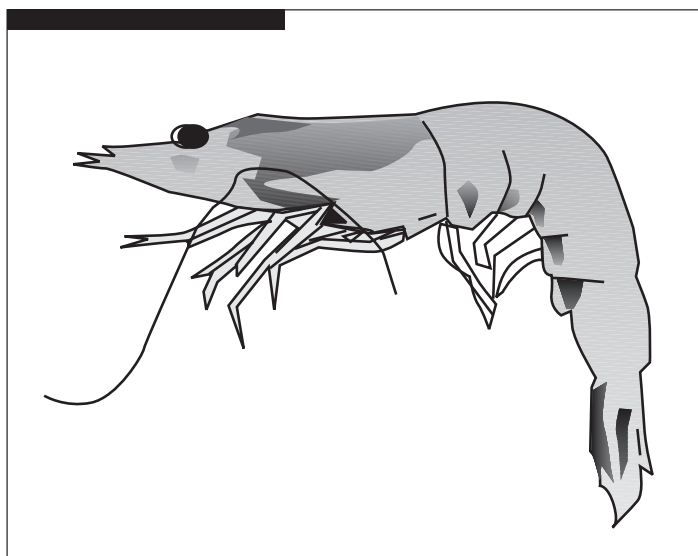
Normal prawn shell should be clear or translucent. Diseased product has the appearance of cooked (white) flesh. Such prawns must be discarded.

White spot/freezer burn

White spot results from freezer burn and can occur particularly where packed prawns have not been covered correctly with a carton liner. Small patches on the head and shell are acceptable, but if all of one side is dehydrated, the prawns must be rejected.

Black spot

Black spot is a defect. Black spot is further explained in the section on *dipping prawns*.



Remember



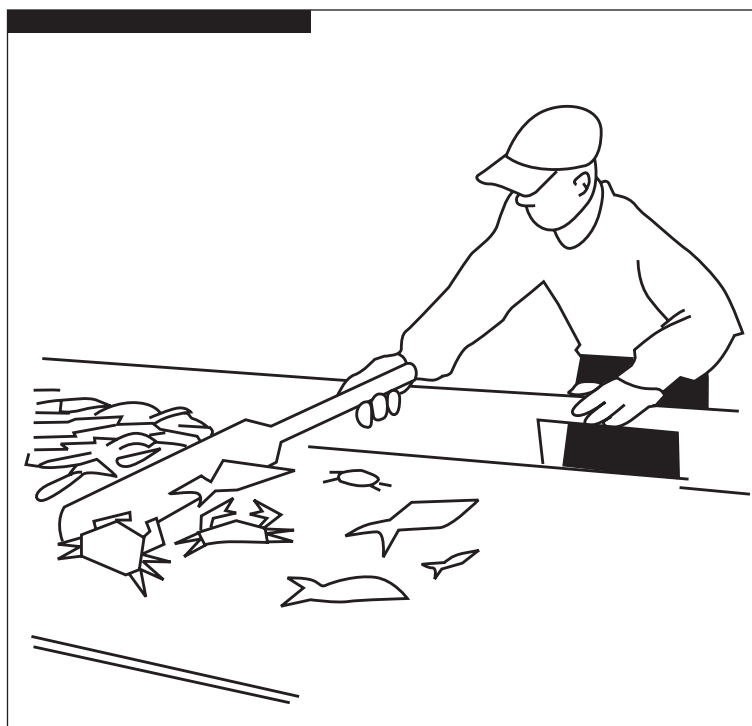
Customers expect no defects or foreign matter!

In practice a very low level of defects, typically 5% by number of prawns, may be tolerated.

Make sure you know the limits.

Tips when sorting

- Use buckets or baskets so you can quickly and easily separate prawns into species, and good quality prawns from defective prawns.
- Return bycatch as quickly as possible to the sea. Be very careful when handling bycatch such as stingrays and sea snakes – you run the risk of serious injury so be careful and if applicable, use teamwork to dispose of them safely.
- Remove other large matter (rocks, sponges, clumps of weed, etc.) so that the prawns are easier to see and sort. Do not throw large matter over the side – you will only recatch it. Dispose of it safely and correctly once you are away from the fishing grounds.
- Use sorting bats, small rectangular pieces of timber, plastic or aluminium (with or without handles) that can easily be kept clean, so that you can spread the remaining contents of the sorting table and make it easier to sort (see the illustration below).
- Be careful not to damage prawns when sorting – you want to minimise rejected product.



Danger



Be careful when sorting. The contents on the sorting table can often contain dangerous bycatch. A jab from a tiny fish can lead to hours of excruciating pain – or worse!

GRADING

Grading means separating the catch into various size groups or grades, using the measurement of counts of individual prawns per pound weight. (Even in this metric age, prawn counts are generally referred to in pounds.)

Grading takes place on trawlers that pack prawns into cartons of different size groups of prawns. Trawlers that are unloading 'run of catch' will not need to grade to size, but may still sort by species and quality.

Grade standards

Grading describes the range of size of prawns in a carton. For example, if you are sorting 10/20 to the pound count, this means that there must be between 10 and 20 similarly-sized prawns per pound in the carton. A common 10 kg carton is 22.5 pounds, so there must be a minimum of 225 prawns and a maximum of 450 prawns in the carton to be within the required size range. Each prawn should weigh between 22 g and 44 g.

Customer expectation is for similarly sized prawns with an average count close to the centre of the allowed range.

Grading in ranges such as 10/20 can mean a large variance in the number of prawns in each carton. Sometimes the catch may have been at the larger size end (closer to 10 to the pound) and other times at the smaller end of the range (20 to the pound). Many buyers now ask for a much closer count such as 6/8 or 9/12, and are prepared to pay extra for the lower variance. This means crew must be more exact when grading.

The following are examples of some grading ranges used, the target and maximum prawns per pound and the minimum and maximum weight per prawn.

1. Typical grades used in bulk (not weighed) or larger weighed packs (e.g. 10 kg)

Per pound (lb)		Prawn weights grams (g)		
Grade	Count		Minimum weight per prawn	Maximum weight per prawn
	Target	Maximum		
U/10	7	9	46 g	over 46 g
U/15	11	14	32 g	over 32 g
10/20	15	18	22 g	44 g
16/20	18	19	22 g	28 g
15/25	20	23	18 g	30 g
21/30	25	27	16 g	20 g
31/50	40	45	10 g	14 g

2. Some other grades use in fixed weight packs (called customer packs)

Grade	Count		Minimum weight Per prawn	Maximum weight Per prawn
	Target	Maximum		
U/6	5 or less	5	76 g	Over 76 g
6/8	6–8	8	54 g	76 g
9/12	10/11	12	38 g	52 g
13/15	13–15	15	30 g	36 g

The allowable range is set by a tolerance level or permissible error factor. This is expressed as a percentage (%) by number and is calculated by counting all of the prawns in a sample, counting the number of prawns out of grade (heavier or lighter than allowed), then calculating the percentage.

A typical maximum tolerance for out of grade prawns is 10% by number for set weight packs and 14% by number for bulk packs.

Make sure you know the standards on your vessel!

Remember



- The smaller the grading ranges and the smaller the weight of the carton, the more precise the grading will have to be to meet the allowable tolerance percentage.
- It is absolutely essential that you learn how to grade accurately and maintain a high standard. Customer satisfaction and the price you get for your product (and in your pay packet) depends on accurate grading.

Grading machines

Many large trawlers have grading machines that do the main grading, only requiring the crew to check for errors. There are two main types of grading machine:

- Roller grading machine
- Haldane grading machine.

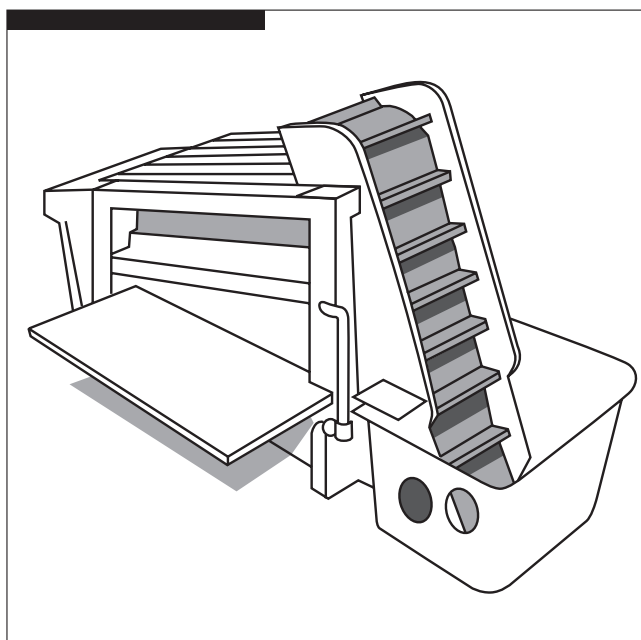
If the vessel you are working on has a grading machine make sure you become familiar with how it operates.

Remember



While modern graders are generally very efficient, there can be mistakes. Make sure you check their results by:

- taking random samples and checking and by regrading
- observing closely when you are packing.



Hand grading

Experienced hand graders can be very accurate. However, when you begin you will need to use examples to refer to. To do this accurately you should use prawns at the limits of each grade as a guide.

Use a prawn at the smallest end of the weight range and one at the largest end so that you are more accurate. It can be difficult to visualise if you simply use an average size prawn for that grading.

While you are practising your grading technique, continually check a sample to confirm your accuracy.

- Count the number of prawns in a known weight. For example, if you are checking a 10/20 count, take a 2 kg sample; there should be a minimum of 44 prawns and a maximum of 88 prawns in the sample. If you are very close to either figure this may mean that you are still outside the tolerance percentage allowed. This can happen if there are a number of larger prawns inflating the weight.
- If you are not sure, take the prawns you think may be borderline and weigh them individually (if you have good, accurate scales). If you are packing 10/20 prawns to a maximum 5% out of grade, then only 4 prawns in 2 kg are allowed out of grade. If packing bulk 10/20 prawns to a 12% maximum, then up to 11 prawns in 2 kg are allowed lighter or heavier than 22–44 g.

You will also need to set up a system so that the different gradings are kept separate. This can be achieved by using buckets or baskets. Accurate grading is very important. Whether you are on a trawler that grades by hand or uses a grading machine you must:

- ✓ *Check the accuracy of gradings by testing sample weights.*
- ✓ *Visually check again as you are doing other tasks such as packing.*
- ✓ *Make sure you keep buckets or baskets of different sizes separate.*

WASHING

Washing prawns is critical to ensure they are free of mud, sand and other matter. Incorrectly washed prawns will severely shorten the life of the dipping solution. In addition, prawns packed while they are still dirty run the risk of contamination.

When washing prawns make sure you do not overfill the basket. Half full is about the maximum if the prawns are to be thoroughly washed. If the prawns are particularly dirty, it pays to have the basket even less than half full.

Prawns are best washed by two people – one person to move or rock the basket and someone else to rinse the prawns with the deck hose. Make sure that all the prawns are thoroughly washed and only clean water is running from the basket.

If you are washing the prawns on your own you can balance the basket on something on the deck that can act as a fulcrum. Then with one hand you can tip the basket from side to side and direct the deck hose with the other hand. It will pay to have fewer prawns in the basket if you are washing on your own so that you are still able to agitate (stir up) the prawns sufficiently to thoroughly wash them. Only use the deck hose as the balancing fulcrum if it is made of thick enough material to take the weight without restricting water flow.



Only half full or less when washing very dirty prawns

The prawns are now ready for the next process, which is most likely dipping or cooking.



SELF CHECK

	YES	NO
Can you explain and or demonstrate the three separate steps in sorting prawns?		
Do you understand why it is important to return bycatch to the sea as soon as possible?		
Do you know the species of prawns caught in the area you are likely to be fishing, and can you identify them?		
Can you identify the defects in prawns that you need to be aware of?		
Do you know the tolerance limits of defects and foreign matter allowed in your fishing operation?		
Do you know the difference between a customer fixed weight pack and a bulk pack?		
Are you able to grade prawns accurately according to the size groupings required on your vessel?		
If a grading machine is likely to be used in your operation, do you know how it operates?		
Do you know methods to ensure accurate grading?		
Do you know the correct steps to follow to ensure prawns are properly washed?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer or a senior crew member for help.



DIPPING PRAWNS

WHY ARE PRAWNS DIPPED?

Black spot is the darkening of the head, shell and tail of prawns caused by a black pigment called melanin. This is a chemical reaction that occurs most rapidly in the presence of oxygen when prawns are warm.

While black spot is not harmful, it is important to prevent so that the quality of your prawns is maintained. Nothing puts a customer off quicker than discoloured prawns. Export and domestic regulations allow a number of chemicals to be used to help prevent black spot. There are a range of treatments that can be used including:

- Metabisulphite
- Everfresh
- HQ Bacterol F
- Antidot.

Sodium metabisulphite is the most commonly used treatment, so the following information concentrates on the correct use of a dip containing 'meta', as it is commonly called.

WHAT IS SODIUM METABISULPHITE?

There are strict regulations on how much meta is allowed in prawns. Check what that amount is for your market. Prawns dipped for one minute in a solution of 1 kg of metabisulphite to 100 litres of water should generally satisfy requirements.

Sodium metabisulphite is an antioxidant. When it is applied in solution it forms a barrier that stops the oxygen necessary for the chemical reaction that forms melanin, and hence prevents black spot from developing.

Meta is mixed with water to form a solution or 'dip'. It is essential that the ratio of metabisulphite to water is correct. While regulations allow the use of metabisulphite, there are strict limits on the amount that is allowed in prawns. These are set to ensure that people do not suffer allergic reactions when eating prawns.

The amounts vary for different markets, so follow the skipper's instructions carefully.

Prawns that are to be frozen on board are dipped in the solution prior to being packed and placed in the snap freezer. The prawns need to soak up enough metabisulphite to ensure black spot does not occur when there are temperature fluctuations such as when unloading, or immediately after defrosting for sale.

Danger



Metabisulphite gives off sulphur dioxide, which is a severe irritant to the lungs. Care must be taken in its use. It should not be handled by anyone with asthma or chest complaints, nor breathed in confined spaces.

CORRECT USE OF METABISULPHITE

Storing metabisulphite

- Do not allow meta to get wet. It will lose its effectiveness.
- Part bags will also lose their effectiveness unless sealed properly. Use them as soon as possible.
- Store it away from direct heat. It is explosive in certain situations – particularly if stored in a confined space.

Making a dip

The correct amount of meta to water is very important. All trawlers should have a dedicated dipping tank with a mark to show the correct level of water.

- Make sure the tank is thoroughly cleaned and sanitised.
- Fill with water to the marked level.
- Put in the recommended amount of meta. It usually comes in 1 kg bags and a typical ratio is 1 kg to every 100 litres of water.
- Make sure the meta is dissolved in the tank before adding prawns.



Remember

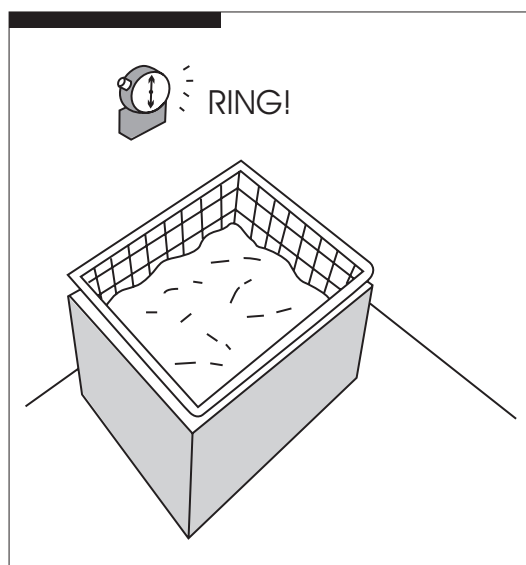


- **Too little meta** and the prawns may go black during freezing or subsequent handling.
- **Too much meta** and the level may be higher than the regulations allow.

Dipping prawns

It is very important that prawns are given good coverage and that the time they spend in the dip follows the specified recommendations. If you are following the example described in the previous section, this will be 1 minute.

- Do not overfill the basket with prawns.
- Thoroughly wash the prawns in the basket first to remove any mud and other matter. Dirty prawns will lessen the life of the dip water.
- Make sure the meta is fully dissolved in the tank before adding prawns.
- Lower the basket of prawns into the dip tank and agitate the basket to ensure good coverage.
- Find a method that allows the product to receive the correct dipping time:
 - Use a routine that you know takes the required time, such as collect basket, wash prawns, place basket in dip, collect second basket, wash prawns, take out first basket, place next basket in the dip and so on.
 - Have a kitchen timer nearby set to ring after the required dipping time.
 - Sing a song – find a verse that takes the required dipping time to sing.
- Take the prawns from the dip – make sure you drain the basket over the dipping tank so that you do not lose dipping water.



The dip solution should be changed at least every 400 kg of product dipped or if the solution becomes dirty or discoloured.

Remember



If you want a quality product that meets regulations, ensure you follow correct dipping procedures.

- ✓ *Store metabisulphite correctly.*
- ✓ *Follow the manufacturer's instructions when preparing a dip solution.*
- ✓ *Wash prawns thoroughly before dipping.*
- ✓ *Make sure you leave the prawns in the dip for the recommended time.*
- ✓ *Change the dip solution regularly according to manufacturer's instructions.*



SELF CHECK

	YES	NO
Do you understand why prawns are dipped?		
Can you name some of the treatments that can be used and do you know what method is likely to be used in your operation?		
Do you know the correct procedures to follow when using metabisulphite?		
Can you follow the procedure used if your operation uses another treatment method?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.



COOKING PRAWNS

In response to market demand, many trawlers cook their prawns on board. It is critical that this process be conducted correctly. Prawns that are either undercooked or overcooked will probably be rejected by the buyer and will certainly damage your product's good name. Undercooked prawns may still contain live spoilage or harmful bacteria which may not be killed by freezing.

HANDLING PRAWNS BEFORE COOKING

- Prawns needed to be graded so that the same size range is in the cooker at the one time. Large prawns take longer to cook than small prawns so it is important to grade them and cook separately.

Even if you are on a trawler that is doing 'run of catch', the prawns should at least be graded into an approximate size range such as small, medium and large, to ensure even cooking can take place.

- Prawns should be thoroughly washed just before cooking.
- If delays are expected before the prawns are to be cooked, they need to be chilled, either by storing in chilled sea water or with ice.
- Prawns for cooking will not need to be dipped unless there will be a delay greater than 30 minutes. In this case (particularly in warm climates) it may pay to dip them – generally for about half the normal time (about 30 seconds). Check the procedure for your vessel with your skipper or supervisor.

COOKING PRAWNS

There are many different types of cookers and heating methods, so the information that follows provides only a general overview of preparation and cooking procedures. Make sure you become familiar with the cooker and its operation on the trawler you are working on. The heating method can be:

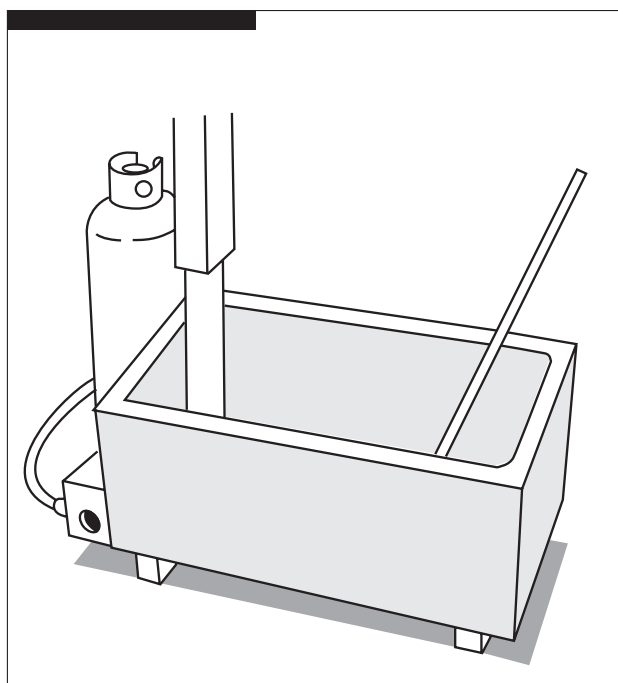
- gas (generally LPG)
- fuel (such as diesel)
- electricity.

The cooking times can differ with the heating method used.

Preparing the cooker

The prawn to water ratio is 6:1 (6 litres of water to 1 kg of prawns). So if a cooker holds 100 litres of water, 15 kg of prawns can be cooked at one time.

- Make sure the cooker has been thoroughly cleaned.
- Have a mark that you fill the cooker to.
- Fill to this mark and turn on the heating source.
- If salt is added use a constant amount and check the flavour of a test batch.
- Allow the water to come to the boil (100°C) before prawns are added.



Danger



Make sure the water level is not too high or you may be scalded from boiling water in rough seas and when the trawler is rolling.

Procedure for cooking prawns

Generally the cooker will have a basket that fits into the cooker – the required amount of prawns can be placed into this first. If the prawns are placed straight into the cooker without using a dedicated basket, make sure you have the required amount in a prawn basket ready to empty into the boiling water.

1. Lower the cooker basket (or empty the contents of the prawn basket) into the cooker.
2. Take care so that valuable boiling water is not lost.
3. Stir the prawns to ensure even cooking.
4. Visual assessment is the best method for cooking time.
5. Once the prawns float (caused by the cooked meat shrinking and air bubbles forming under the shell), cook for a further minute.
6. Take the prawn basket from the cooker or use a scoop to scoop prawns from the top of the cooker.
7. Place the prawns into a tank of chilled clean sea water. This stops the cooking process immediately.
8. If chilled water is not used, the prawns should be cooled by using running sea water.
9. They should be left in the chilled salt water for at least 2 minutes or clean water allowed to run through until they are properly cooled.
10. They should then be drained for 1 minute and then packed and frozen or placed in a storage tank of chilled (0°C) sea water.

Remember



- ✓ *Even cooking depends on tight grading.*
- ✓ *Do not put too many prawns in the cooker at once. Use a 6:1 ratio.*
- ✓ *Stir the prawns whilst cooking to ensure all prawns are cooked evenly.*
- ✓ *Cooking times are critical. 10–15 seconds can make a difference.*
- ✓ *Immediately cool the prawns once they are removed from the cooker.*
- ✓ *Containers used to chill prawns should be cleaned and sanitised before use.*
- ✓ *Thoroughly wash your hands and wear gloves when handling cooked prawns.*
- ✓ *Never handle cooked and raw prawns together.*

Cooked prawns are ready-to-eat products and have strict bacteria standards. Make sure prawns are hygienically handled, cooking equipment is thoroughly cleaned and clean sea water is used for cooling.



SELF CHECK

	YES	NO
Do you know why it is important to grade prawns prior to cooking them?		
Do you understand the cooking procedure likely to be used in your operation?		
Can you describe some important steps to follow to ensure a correct cooking process?		
Do you understand why hygiene is so important when handling cooked prawns?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.

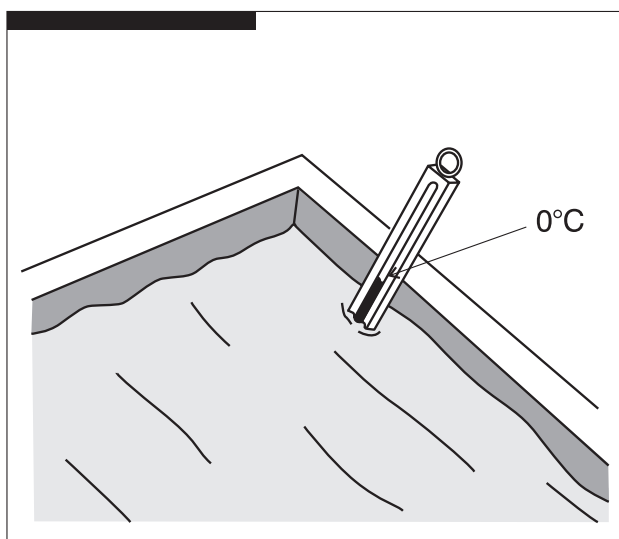


STORING PRAWNS IN CHILLED WATER

Many smaller trawlers and trawlers fishing close to markets do not pack and freeze on board. Rather they store their catch in chilled water (0°C – 4°C) and unload daily or keep them for a maximum of three days before unloading. In busy fishing periods, freezer trawlers will often use chilled sea water to hold prawns until there is time to pack and freeze them at a later time.

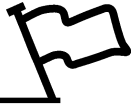
PREPARING A TANK FOR CHILLING PRAWNS

- The tanks must be thoroughly cleaned and sanitised before use and only used to store prawns.
- The tank should be either filled with potable (drinkable) water and food grade salt or more usually with sea water.
- When using sea water fill the tanks at a minimum of 5 km from the coast or estuary. If you have to fill the tanks alongside the wharf for stability reasons, make sure the tanks are flushed at sea with clean sea water.
- The tanks must be prechilled to a maximum of 2°C before prawns are stored in them and keep a check on the temperature once prawns are stored to ensure it doesn't rise above 5°C.
- Rapidly chilled prawns should not need meta to prevent black spot. If meta is needed, use very low levels (e.g. 50 g per 100 litres) as the prawns will continue to absorb meta over time.



Store prawns in chilled water

Remember

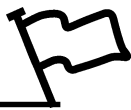


Prawns deteriorate rapidly after catching, so sorting must be quick and chilling as fast as possible. The water in the tanks that will hold the prawns must already be at 2°C. Remember the water temperature will rise as the warm prawns are placed in the tank.

STORING AND UNLOADING PRAWNS

- Prawns should ideally be placed in netting bags before being placed in the chilled water tanks so that unloading is easier.
- Do not put too many prawns into one bag. There is the risk of damage, particularly when they are lifted from the water and the weight is placed on the prawns at the bottom of the bag. Check with your skipper or supervisor for the amount of prawns to put in each bag.
- If the prawns have been sorted into species, soft/damaged or size graded, use separate bags to keep them all separate.
- Use a system such as individual strings or ropes for each bag so that it makes it easier to get each bag for unloading. This is particularly relevant if the trawler has deep tanks.
- Never put cooked and green (raw) prawns in the same tank.
- When lifting the prawns from the tank to unload, drain the bag over the tank to save chilled water.
- If packing and freezing, be as quick as possible so that the prawns do not deteriorate.

Remember



- ✓ *Make sure the tanks are thoroughly cleaned and sanitised.*
- ✓ *Fill the tank or tanks with clean water.*
- ✓ *The water should be at a maximum of 2°C before prawns are stored.*
- ✓ *Separate species, soft/damaged and size gradings.*
- ✓ *Never store cooked and raw prawns in the same tank.*
- ✓ *When the prawns are unloaded from the tank, work quickly to prevent spoilage.*



SELF CHECK

	YES	NO
Do you know the temperature prawns need to be kept at and the maximum time they can be left on board before unloading and processing?		
Do you know how to prepare a tank ready to store prawns for chilling?		
Can you describe how prawns are likely to be stored in the chilling tanks in your operation?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.



PACKING AND WEIGHING PRAWNS

The majority of prawn trawlers now pack and weigh prawns at sea, and freeze the product on board. This keeps the prawns in excellent condition and allows the trawler to stay at sea for much longer periods before unloading.

There are different types of packs depending on the market that the trawler is supplying. In all cases it is essential that you learn to be accurate when you pack. Packing prawns requires that you meet certain standards to ensure your trawler's product retains a good name.

NET AND GROSS WEIGHT

Gross weight

Gross weight is the total weight of a pack of prawns including the prawns, carton and liner (and any excess water that has not been allowed to drain away). It is the weight that is often used to determine costs such as freight.

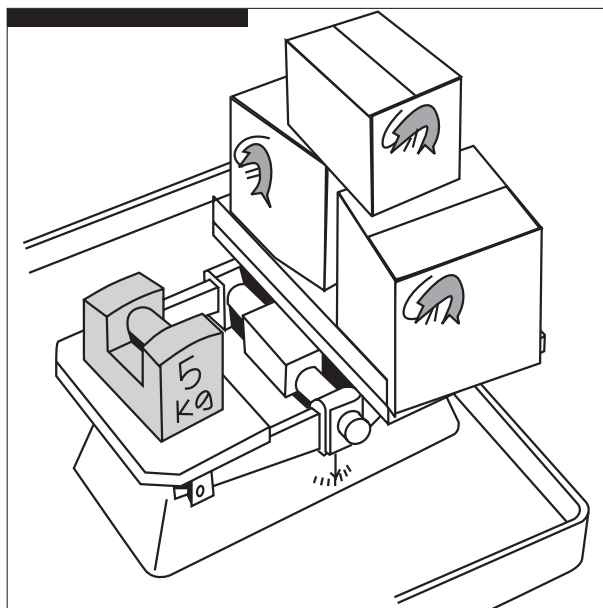
Net weight

Net weight is the actual legal weight of prawns in the pack and is the weight that is used to determine how much is paid for a pack of prawns.

Checking scales for accuracy

It is very important that scales are checked regularly for accuracy. Scales that are inaccurate either mean you run the risk of selling underweight packs or you are selling overweight packs and losing money. Checking is best done by using a known weight that you periodically put on the scales and take a reading of.

If you have electronic scales on your vessel, follow the manufacturer's instructions on how to check them.



PACKING

There are generally two types of packs that trawlers use – random weight (bulk packs) and fixed weights. The bulk packs will be further processed ashore whereas the fixed weight packs will generally go straight to the marketplace as packed on board.

Cartons are designed to be flattened when stored aboard at the start of a trip and then folded into shape when required. They will usually come in packs of 50 and then fold and clip into place. Some may require stapling.

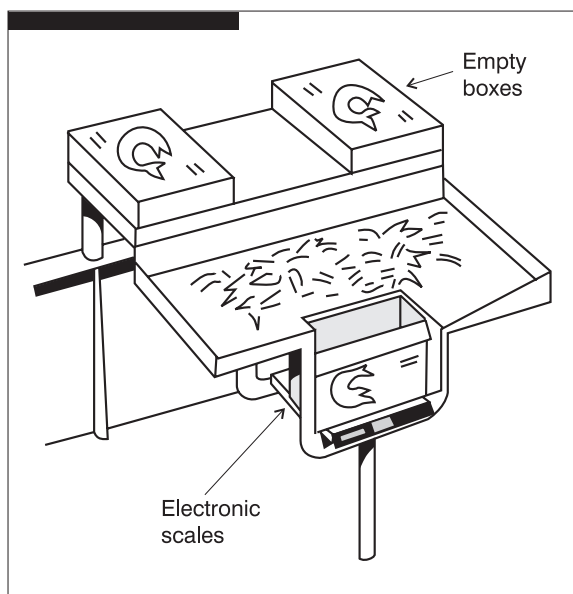
A plastic liner is sometimes placed inside each carton to prevent freezer burn during the freezing process.

It is usual practice to assemble enough cartons for a night's fishing, but make sure they are stacked somewhere they will remain dry.

Random weights (bulk packs)

These packs generally hold around 10 kg and will be further processed ashore. The weight is not critical although you should make sure you do not overfill the pack.

- Assemble the cartons as designed and place a liner inside each. Store them in a dry spot.
- When required place the cartons in the designated position for packing. This will vary from trawler to trawler, so make sure you are familiar with the method that you will use. Bulk packs are often packed five at a time and the prawns are loaded in one end of the carton.
- Make sure the prawns are well drained of water.



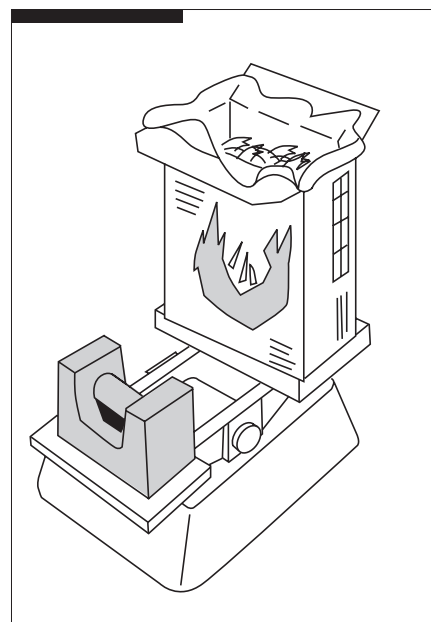
- Check that all foreign matter is taken from the prawns to be packed.
- Fill the pack or packs until they are comfortably full – do not overfill and let the pack bulge outwards. Net weight should not exceed 12 kg.
- Close the liner so that the prawns are protected from freezer burn.
- Fasten the carton as designed.
- Mark the carton according to your vessel's procedure (refer later in this topic).

The packs are now ready to be transferred to the freezers.

Fixed weight

The total weight of fixed weight packs will vary, but typically are either 10 kg, 5 kg or 3 kg. The smaller packs are called customer packs and will not be repacked but sold as is. The weight is critical and must not be less than the designated amount.

- Assemble the cartons and place a liner inside each. Store in a dry spot.
- When required place the cartons in the designated position for packing. This will vary from trawler to trawler so make sure you are familiar with the method that you will use.
- These packs will have the prawns loaded while sitting on a scale and are almost always top loaded.
- 'Tare' the scales. This means that the weight of the carton and liner has been allowed for and the scale will read zero. The scales may already be set up with a tare allowance.
- Drain the prawns of water for at least 1 minute. Remember that customers do not mind paying a good price for prawns but will object to paying for water. Ice in packs is a common complaint.
- Check that all foreign matter is removed from the prawns before packing.
- Carefully fill the pack with prawns until the required weight is reached. Allow a slight overpack so that if the product is checked after freezing the average weight will be at least the declared weight.



- Do not let this be too great – you do not want to give prawns away. When packing large prawns (6 to the pound) in small cartons (3 kg), one too many prawns can make a big difference. Check the procedure used with your skipper or supervisor.
- Customer packs often have at least the top layer finger laid, which means the prawns are neatly laid out in line so that they present well when the carton is opened. Check to see if you will need to finger lay and have an experienced person show you how it is done.
- Close the liner so that the prawns are protected from freezer burn.
- Fasten the carton as designed – this may be by stapling the lid or placing packing straps around the carton.
- Mark the carton according to the procedure used in your operation (refer below).

The packs are now ready to be transferred to the freezers.

MARKING CARTONS

All cartons packed on board will need to have some information marked on each carton. The amount of information depends on where the prawns are destined to go after being unloaded from the trawler. The information is generally marked with a waterproof marking pen.

Most cartons have some information already marked when the cartons are prepared at the factory. For example, the brand name to distinguish the trawler or company will be on all customer packs and the commonly used gradings will already be displayed. All that is required on board is to tick a box alongside the relevant grading. Similarly a box can be ticked to identify whether the prawns are cooked or raw. If a standard net weight is used, this will already be marked.

You will need some sort of recording method so that an accurate record of the catch, size, species, etc., can be kept. This may be on a whiteboard near the packing area or a book designed for this purpose.

Bulk processing packs

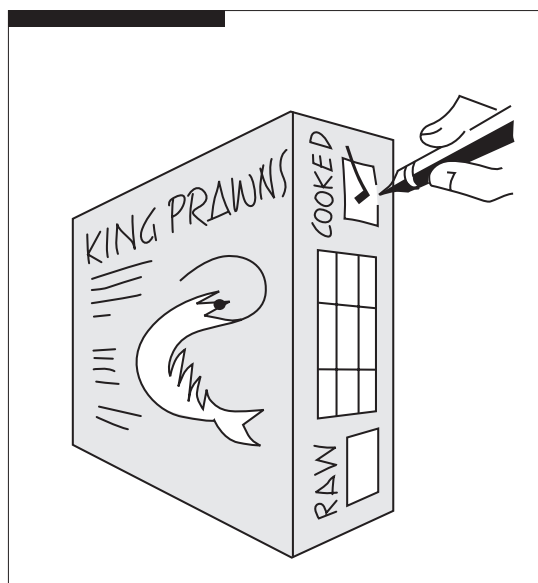
Prawns that will be further processed on land can be packed and frozen in unbranded cartons. However there is still some information that you will need to mark on the carton. The information that is required includes:

- species (e.g. banana prawns)
- grade (e.g. 10/15)
- additives used (e.g. metabisulphite added)
- vessel name and number (e.g. FV Pisces, P145)
- net weight (e.g. 11.4 kg) [not always necessary for random weight packs to be further processed]
- date of catching/freezing (e.g. 29-11-02)
- export registration number (if product may be exported).

Customer fixed weight pack

Prawns which may be exported or sold without further processing will need additional information. The minimum markings that will be required on these cartons include gradings, species and cooked or raw as on bulk packs, as well as:

- establishment number of vessel (may already be marked on the carton and is the AQIS number assigned to the vessel)
- catch or freezing date (e.g. 6-12-02)
- Description of contents (may already be marked on the carton and may be something like 'Frozen Whole Shrimp')
- Additives used (e.g. metabisulphite added)
- Name and address of exporter (e.g. Pisces Fisheries, Ocean View Road, Cairns will already be marked on the carton)
- Product of Australia (will already be marked on the carton)
- Keep frozen at or below -18°C (already will be marked on the carton)
- Net weight (on customer packs will generally be marked on the carton)



- Brand name (e.g. 'Ocean Fresh Prawns' will already be marked on the carton)
- Batch number or serial numbers (will need to be marked in the designated spot on the carton and may be something like 10-126 indicating the date and the number of the carton packed on that date).

Remember



- ✓ *Check the scales regularly for accuracy.*
- ✓ *Prepare cartons and liners ahead of the day or night's fishing.*
- ✓ *Keep the cartons in a dry place before use.*
- ✓ *Drain prawns of water before packing (1 minute).*
- ✓ *Make sure any foreign matter is discarded.*
- ✓ *As you pack, check (visually) that the gradings seem accurate.*
- ✓ *Do not overload bulk packs.*
- ✓ *Slightly overpack customer packs to ensure correct net weight.*
- ✓ *Secure cartons correctly according to the method used in the operation.*
- ✓ *Make sure the cartons are correctly marked.*
- ✓ *Keep a record of all packing details.*

Customers demand a high quality product, accurately labelled and true to weight.



SELF CHECK

	YES	NO
Do you know the difference between net weight and gross weight?		
Can you describe a method that could be used to check the accuracy of scales?		
Do you know the type of packs and are you able to correctly follow the procedure used to pack in the operation you are likely to be involved?		
Can you describe the information that needs to be marked on the cartons used in your operation?		
Can you make a list of steps that should be followed on board to ensure a quality pack is produced?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.



FREEZING PRAWNS

Prawns that are to be frozen on board must be kept below -18°C once they have been frozen. They are snap or fast frozen in a special snap freezer designed to bring the temperature down quickly and then held in a storage freezer at the required temperature (-18°C) or colder until unloaded.

THE GOLDEN RULES OF FREEZING

1. *Freeze it fast.*
2. *Freeze it cold.*
3. *Keep it frozen.*

Freezing is not about putting cold into a product, but about removing heat from the product. Similarly, frozen storage is not about losing 'cold' but about preventing heat from entering the product. The procedures you will be involved in as a crew member on a freezer trawler will, if properly followed, help the freezing process.

LOADING THE SNAP FREEZER

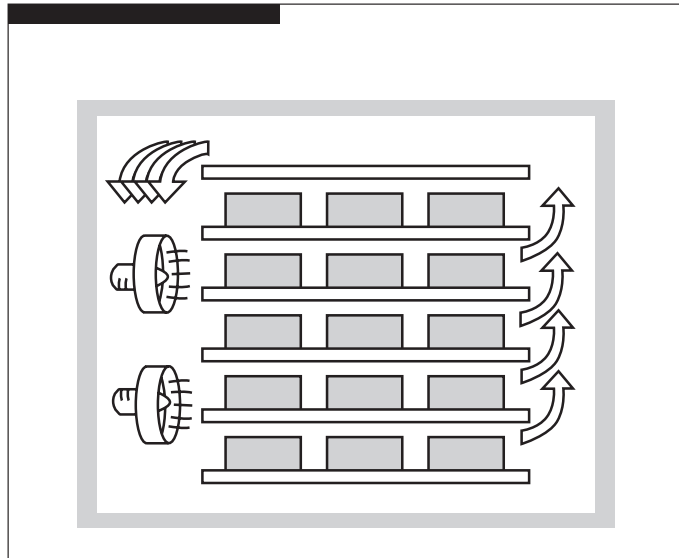
Modern freezer trawlers almost always have what is referred to as a snap freezer. Some trawlers may still have what is known as an IQF (instant quick freeze), which uses a solution of heavily-salted water to quickly lower the temperature. However, this Learning Guide follows the procedures used for a snap freezer.

One type of snap freezer consists of layers of refrigerated coils set up in a shelf-like system and at a distance apart that allows a 10 kg carton to fit comfortably with adequate air able to flow around it. There will be a number of fans positioned at one end that forces the cold air over the cartons of prawns. The snap freezer is the critical area where *freeze it fast* takes place.

The snap is designed to bring the prawns down rapidly through the latent heat phase (which ends at around -10°C). This is the temperature range where most problems occur. If the time taken is too long, the prawns will spoil or at best have a short shelf life even when frozen. A good freezer should get the prawns down to this temperature in 8 hours and to -18°C in 12 hours.

When loading a snap the following procedures need to be followed:

- Make sure the cartons and the liners are securely closed.
- Wear appropriate cold room clothing – preferably a freezer suit.
- Turn the snap fans off while working in the snap freezer.
- Work as fast as possible so that the snap area is open for the least time possible.
- Stack the cartons evenly on the shelves or coils.
- Do not stack cartons too tightly and make sure all the cartons are going to get a good airflow from the forced cold air of the fans.
- When the snap freezer is loaded, shut the doors or replace the partitions and turn the fans back on.
- Observe the temperature on the snap freezer gauge and note the time.



Do not stack cartons directly in front of the fans. This will slow the freezing process and increase the likelihood of black spot.

The prawns need to stay in the snap until they reach -18°C and then they can be transferred to the storage room. This is the *freeze it cold* cycle.

During particularly busy fishing periods the skipper may need to have the product in the snap freezer transferred before they have reached this temperature (but always at -10°C or colder) so that the next load can be placed in the snap area. Follow his/her instructions and work quickly.

LOADING THE FREEZER STORAGE ROOM

When the prawns have reached temperature (at least -18°C , preferably colder) they will be transferred to the storage freezer. This area is usually adjacent to the snap freezer and it is simply a matter of unloading the cartons from the snap area and stacking them in the storage area correctly. The freezer storage room is a much larger area than the snap freezer and there will be a large unit that provides a good air flow at the required temperature.

Freezer rooms will have an alarm button inside in case you are locked in accidentally or you have a problem. Make sure you know where it is and how to operate it. Check it periodically to ensure it is working.

- Wear appropriate cold room clothing – preferably a freezer suit.
- Always make sure you work with someone else and let people know you are entering the freezer area.
- Work quickly, particularly if the prawns are temporarily exposed to warm temperatures during the transfer. Any fluctuation (upwards) in the core temperature can cause a dramatic loss of quality and reduce the shelf life of the product.
- Stack the cartons so that they will be secure, particularly in rough weather.
- Frozen prawns can be very brittle, so take care when handling the cartons. Do not throw or drop cartons.
- Make sure the freezer unit is not obstructed and a good airflow circulates the freezer storage area.
- Follow any particular procedures for separating cartons of different species or gradings.
- Make sure cooked and raw prawns are kept well apart.
- If prawns have been transferred from the snap freezer before -18°C has been reached, make sure those cartons are loosely spread so that they receive good airflow.
- One method can be to place them on their edge so that the best airflow is available. Make certain they are secure and will not topple over.

- When finished make sure the freezer unit is operating and all entrance hatches are securely closed.
- Record details and note the temperature of the freezer room.

You will need to continually monitor the temperature gauge and make sure the temperature never rises above -18°C and ideally is around -25°C . This is the *keep it frozen* period and it is absolutely critical for the quality of the product that the lowest temperature is maintained at all times.



Remember



- ✓ *The three golden rules of freezing.*
- ✓ *Wear the appropriate clothing when working in the snap and freezer rooms.*
- ✓ *Turn the fans or freezer units off when working around them.*
- ✓ *Work quickly to ensure the core temperature does not rise.*
- ✓ *Stack cartons so that they receive good airflow. Do not stack too tightly.*
- ✓ *Close all doors, hatches and partitions when finished.*
- ✓ *Make sure the fans and/or freezer units are restarted.*
- ✓ *Constantly monitor the temperature gauges.*



SELF CHECK

	YES	NO
Do you know the three golden rules for freezing at sea?		
Do you understand what a snap freezer is, at what minimum temperature prawns need to be frozen and how quickly they should reach this temperature to maintain quality?		
Can you describe the procedures that need to be followed to correctly load a snap freezer?		
Do you know how to load the freezer storage room correctly?		

- If you have answered YES to all of the questions above, you are ready for the next topic.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.



UNLOADING PRAWNS

There are two major problems that can occur during the unloading process – temperature rise and damage. It is essential that care be taken when unloading or all the effort taken to produce a quality product during the trip will be lost.

TEMPERATURE

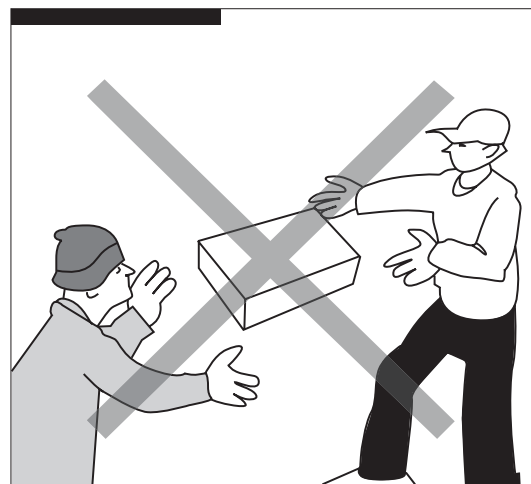
The temperature of the product must be maintained at -18°C during unloading.

- Make sure all unloading equipment (conveyors, baskets, lifting devices, etc.) are in place and ready to go before the unloading begins.
- Have a good and fast system in place and keep cartons out of the sun at all times.
- Do not leave cartons on deck while other cartons are taken from the freezer storage area.
- Shut doors and hatches to the freezer areas and turn refrigeration units back on when there is a break in unloading.
- Make sure wet or chilled prawns go straight into bins with chilled water and/or ice.

DAMAGE

Handle cartons carefully so that damage will not occur. Dropped cartons will easily damage and result in broken prawns.

- Do not throw cartons.
- Make sure they are correctly stacked on conveyor belts, pallets or other unloading devices.
- Put any cartons that are dropped and damaged aside so a decision can be made on their status later on.



DO NOT throw frozen packs of prawns

Remember



All the care taken during sorting and grading can be undone if you drop cartons and break the prawns. This can result in downgrading and reduced price.



SELF CHECK

	YES	NO
Do you know the procedures to follow to ensure prawns stay below the minimum required temperature during unloading?		
Do you understand why frozen prawns need to be handled carefully while unloading?		

- If you have answered YES to all of the questions above, you are ready for assessment.
- If you have answered NO to any question, review the topic again and ask your trainer, coach or a senior crew member for help.



NOTES