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Live Transport of Ornamental Fish

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Introduction

- The industry standard for Dead On Arrival (DOA) is 3 – 5%
- Trade in industry is valued at a minimum of USD\$278 million with an average value of \$0.17 = 1,635 million fish per annum (FAO data)
- Based on 5% DOA = 65 million fish per annum = \$11million
- This figure is low – in reality export data is higher than FAO data suggests
- Mortality does not include Dead After Arrival (DAA) – this could be as high as 10% of a shipment over 7 days
- This can be reduced through proper quarantine and packing practices

Introduction

- Export operations are the interface between breeders and wild collectors and the customers
- Fish must be transported vast distances from exporters to their customers
- Must have a well regimented system for packing in order to ensure fish arrive safely
- Success of transport is usually measured by Dead On Arrival (DOA)
- High DOA = lost customers

Introduction

- The basic principles for transport of live fish are summarised as follows:
 - fish must be healthy and free of disease-causing organisms prior to transport;
 - fish should be starved (purged) prior to transport to prevent excrement from contaminating the water;
 - aeration and/or oxygenation of transport water should be undertaken to ensure adequate dissolved oxygen levels;
 - temperature control measures must be implemented to maintain relatively constant temperatures;
 - the build-up of mucous and metabolic excretory products must be minimised;
 - fish must be protected from mechanical damage



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THE SHIPPING PROCESS

Shipping Process

- In order to achieve this, the key steps are:



1. Sourcing of Fish

- The success of shipping fish comes down to the quality and health of the fish
 - fish must have a good level of stress resistance which generally is related to how they have been grown on the farm.
- good farming practices providing the appropriate water quality and stocking levels, provided good quality feeds, and has handled them correctly = good quality and a healthy immune system that can withstand the stresses of transport.
- Cutting costs and using poor management technique will result in increased DOA
- The shipper must work with farmers to ensure only quality fish are shipped
 - High DOA and poor quality fish lose customers!

2. Conditioning Fish for Transport

- Good quality fish should be held in quarantine and conditioned for several days in preparation for shipping.
- During this time final quality sorts are undertaken and the fish are stabilised to ensure there are no health problems for shipping – much of the success of exporters is based on how well they can undertake this phase.
- Conditioning consists of the following 3 steps:
 - Prophylactic Treatment
 - Starvation / purging
 - Pre-packing

Packing facility



Holding tanks

- Fish are normally held in glass aquaria to make it easy to check for signs of disease, quality etc.
- Any containers can be used - Polyboxs, buckets etc. can also be used
- Common for Koi and Goldfish to be kept in large fibreglass or plastic tubs







Prophylactic Treatments

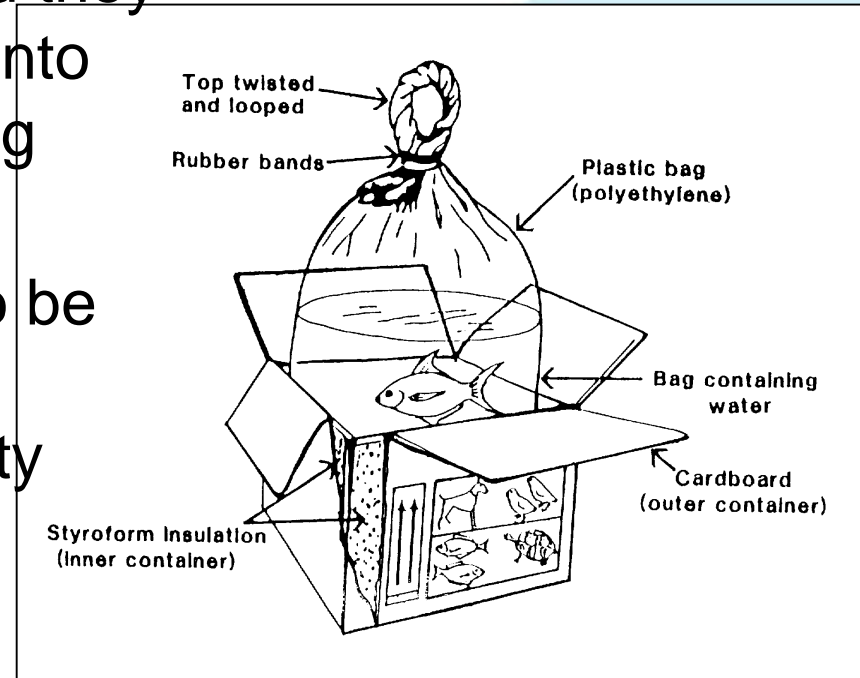
- To ensure fish are free of parasites, it is common to treat 2 – 3 days before shipping
- Water change out treatments and ensure at least 1 day in good water prior to final pack for fish to recover
- Adding salt to water at the rate of 1 to 10 ppt can be beneficial depending on species
- Chemicals such as: Copper, Potassium Permanganate, Acriflavine often used for parasite control
- Alternative is the use of plant extract based products
 - Indian Almond leaf
 - Aquaherb

Purging Fish

- Purging can occur in conjunction with prophylactic treatment before packing (fish should not be fed during treatment anyway)
- Purging is important for several reasons
- Voids digestive tract – fish may vomit or defecate in the bags when not purged
- Slows the metabolic rate of the fish
 - Reduces oxygen requirements
 - Reduces ammonia and carbon dioxide output
- Most species 1 day is sufficient, but larger fish and herbivorous fish may need more
 - Mollies are notorious for needing a longer period for purging

Pre-Packing

- Once fish are sufficiently purged they can be caught and pre-packed into bags to Acclimate fish to packing conditions
- Allows 'weak' or stressed fish to be identified and removed from consignments, also a final quality check before packing
- Count into bag lots and prepare shipment
 - Good time to check numbers of fish etc
 - Is everything ordered available to go?
 - Prepare packing documents etc with correct numbers of fish





Pre-Packing

- Once counted, fish are packed in bags
- Bags are sealed and oxygenated bags often kept on trolleys
 - Do not use air – it does not have enough oxygen, always use pure oxygen
- Ensure to mark bags as to species, size, consignment – important when dealing with multiple shipments



Pre-Packing

- Pre-packed bags of fish must be kept in a cool dark area to acclimate
- Ideally cool down in an air-conditioned room to desired temperature
- Bags of fish normally put into coolroom and chilled to 22-23°C (72 – 74°F) for Tropicals and 15-18°C (59 – 65°F) for coldwater species to acclimate them to packing conditions – minimum of 4 to 6 hours (many do this overnight)
- salts may be added at between 1 to 3 ppt depending on species

Pre-Packing



Final Pack

- Once the fish have finished the pre-packing process they are ready for final packing
- Fish that show signs of sickness or stress should not be shipped
- Remember if it looks suspect at your facility – it will only get worse during transport







Final Pack

- Ensure you pack with the correct amount of water
 - Not enough = problems
 - Too much = higher landed cost
- Fish bags are filled with 1/3 water to 2/3 oxygen – around 50 – 60% oxygen is average.
- Pack the fish in polystyrene boxes
 - Ensure they are properly marked – many exporters list the contents of box on outside for easy reference
 - Don't squash the boxes in too tight – bags expand during the flight and if too tightly packed may burst or leak
 - Ensure the box is full
- Bags can be put in standing up or laying down
 - Laying down gives better surface area for gas exchange

Final Pack





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**GETTING IT TO THE
CUSTOMER**



Transporting and Transferring

- Getting fish to the customer as quickly as possible is vital to ensure health and quality
 - Always use direct flights if possible
 - Arranging the freight yourself can be cheaper but can cause massive problems
- The air transport of ornamental fish is governed worldwide by the International Air Transport Association (IATA).
 - standards for type and total weight of the expanded polystyrene (EPS) box, types of plastic bags and method of tying.



Courtesy of SMG Ltd.



Labelling Requirements

- Labelling must also meet IATA and airline requirements, and the following must be included on each box:
 - Consignment note must be filled out legibly
 - 'This end up' stickers
 - Boxes must be marked as 'Live Fish'
 - 'Handle with Care' stickers
 - Customer contact details
 - Number of boxes in consignment
- Similar labelling is required for road transport



Paperwork and Documents

- Always consult with the receiver as to what paperwork they require – if you are not sure ask for examples to be sent
 - A shipment can be destroyed or sent back if the paperwork is not correct
- Airway bill
- Invoice and packing lists
- Health Certificate (varies with country)
 - If these are required contact your veterinarian authority in plenty of time to organise this
- Fish may also have to be inspected prior to packing to get this



Summary

- Transportation is critical to the success of ornamental fish production – fish must arrive alive to the customer
- Only healthy, good quality fish should be transported
- Correct conditioning (prophylactic treatment, purging, pre-packing) are needed to get fish ready to ship
- Correct preparation of packing water is essential for final pack, correct ratio of water and oxygen needed
- Communication and correct paperwork – make sure you know what is required

Export Market Considerations

- Indian exporters need to find their niche – what is unique and what are they good at!
- Quality – fish must be disease free, colourful, uniform size, no physical damage
- Biosecurity vital for future sustainability
- Supply only what is ordered and as ordered
- Communicate with your customer

Industry development

- Industry co-ordination needed, industry members must communicate, also need more coordination between government/university and industry
- Price expectations – too high for export market, exporters/breeders must accept international market prices
- Reduce input production costs, farmers must achieve economies of scale through mass production

The end – Thankyou!

- Any questions?
- I can be contacted on email:
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