SEA FISH INDUSTRY AUTHORITY Industrial Development Unit
TIME-TEMPERATURE STUDIES IN THE DISTRIBUTION OF FRESH FISH IN SUMMER
Technical Report No. 228 October 1983 M. Myers

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SUMMARY
This report represents the findings of a study into the loss of quality through poor temperature control and/or delay in the distribution of fresh fish from quayside to consumer. It examines the practices of: landing, auction, transportation, storage, processing, wholesaling, retailing, and of the consumer. The survey was conducted during the summer months of July and August 1983 and involved the recording of over 5,000 temperatures nationwide.
The report identifies problems of temperature control and delay throughout the chain and concludes that their combined effect results in good quality ish being unnecessarily ruined or downgraded.
It further makes recommendations for the encouragement of higher quality standards by means; technical, educational_ or =Legislative.

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TIME-TEMPERATURE STUDIES IN THE DISTRIBUTION OF FRESH FISH IN SUMMER

1 INTRODUCTION

Recently there has been considerable debate on the handling and transport of fresh fish and the effect that existing practices
have on quality, with accusations and counter accusations of malpractice and inflexibility from various sectors of the industry. (See reference 1, which is reproduced in Appendix 1). The argument is not new and is symptomatic of a fragmented industry with diverse interests and complex channels of distribution. Fresh fish is by nature a most perishable produce and its keeping and quality are highly dependant upon its temperature history. Much argument has centred on the adequacy of temperature control and speed of distribution through the chain.

This report presents the findings of a temperature survey conducted in the U.K. during the months July and August of 1983, covering the distribution of fresh fish from landing to consumption. It includes the port auction, port processing, wholesaling and retailing. The survey excludes fish packed under a controlled atmosphere (CAP) as this is subject to independant SFIA study and is reported separately (see reference 2).

The survey involved the recording of over five thousand temperatures of whole fish and fillets in the U.K. distribution chain (with the exception of Northern Ireland) in a similar fashion to the more comprehensive survey carried out by Torry Research Station over a quarter of a century ago. (See Reference 3). Two teams of two persons toured the major ports, wholesale markets and retailers nationwide using Ni-Cr/Ni--Al probe digital thermometers and disposable temperature recorders to record temperatures.

The purpose of the survey is to objectively and impartially identify problem areas, to draw attention to them and to make recommendations for improvement. It is not the intention to deprecate any sector of the trade as it is certain that examples of malpractice can be demonstrated as being common throughout the chain.

2 LANDINGS AND AUCTION

Factors affecting the temperature of fish on the market can be listed as follows:

a) temperature of fish on landing, which is related to b) and
b) efficiency of icing at sea
c) method of stowage
d) the absence of ice or otherwise in the market box
e) period of time elapsed from landing
f) ambient temperature and exposure to direct sunlight and wind
g) type of fish box
h) position of individual fish within the box
i) position of a box within a stack or block of boxes
j) temperature control within the market building
k) the efficiency, control and organisation of discharge labour in its effect on e)
1) physical constraints of the market building in its affect on the efficient and rapid removal of fish after sale (ease of access to, from and on the market) and use of mechanised handling

As it was not practicable to evaluate the individual effects of the above factors upon fish temperature effort was made to measure temperatures of fish at different positions within a box, for boxes in varying positions within a block of boxes. Measurements were made between the time of landing and auction ,sale. The investigation was not intended to provide a precise scientific evaluation of the thermal dynamics of the system but to give an appreciation as to the order of problems in maintaining efficient temperature control. Eighteen hundred recordings were made nationwide and the overall average temperature of fish on the market for all ports combined was found to be 5.7 degs. C in a temperature range of. -0.5 to +20 deg. C although differences between ports were marked. Table 1 shows the results of survey at twelve selected ports. It is not

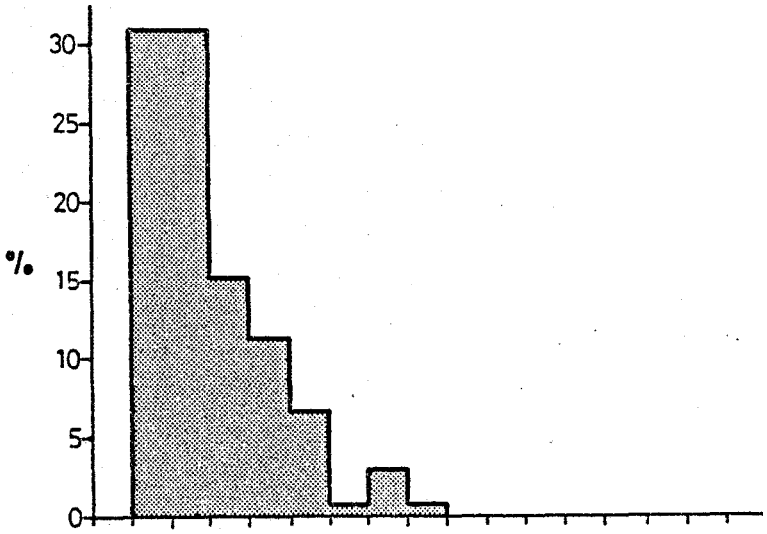
considered insignificant that the top three ports (in terns of temperature control) were the Scottish ports of Peterhead, Fraserburgh and Aberdeen: ports with a strong tradition of boxing the catch at sea.

Probably the most obvious factor to be identified by the survey is the efficient use of ice, both at sea and on the market. In this respect fish properly graded, boxed and iced at sea landed directly to the market for auction in the same box is at an advantage. Not only is it handled less but continues to be cooled by the presence of the ice. Bulk-stowed fish is usually graded on discharge and the ice separated from the fish in order to weigh to the unit of sale. Seldom is it re-iced after grading although the period that it stands unprotected on the market can be as long, on some markets, as seventeen hours, which during hot summer months can be ruinous to fish quality.

The distribution of fish temperatures on the port market for three selected ports are shown in Figure 1 and tend to reflect the practices of the ports as mentioned above. Peterhead boxes fish with ice (although boxing practice is not ideal, see reference 9), Grimsby shelf or bulk stow, and Brixham mostly boxes but with little or no ice. (There are of course individual exceptions to these generalisations).

The argument that proper temperature control is of no great significance because of the relatively short timescales involved either in the fishing trip or on the market is a spurious one as the argument is repeated throughout the chain, next by the merchants and transport companies, right through to the fish monger. The combined affect of this malpractice is a major factor in the poor quality of fish.

PETERHEAD



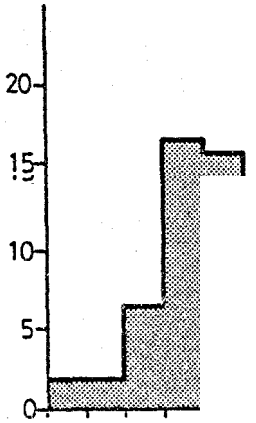
Average Fish Temperature 1. 80 C

-1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 °C Fish Temperature

0/0

-1 0 1 2

GRIMSBY



3 4 5 6 7 8 9 1011121314151617 ° C Fish Temperature

Average Fish Temperature 4.9°C

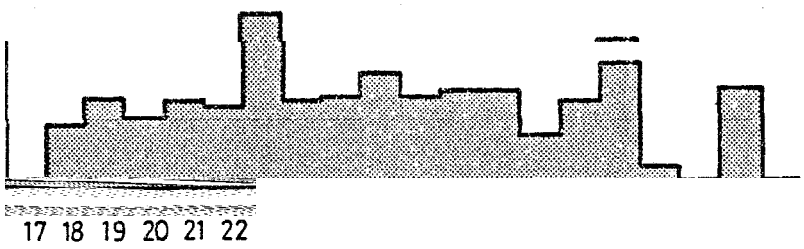
0

15 Average Fish Temperature 8.5°C

101

5

BRIXHAM



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- 1 0 1 2 3 4 5 6 7 8 9 10 11 12

13 14 15 16 ° C Fish Temperature

Distribution of Fish Temperatures or the Port Market Fig. 8:

TABLE 1
FISH TEMPERATURES ON THE PORT MARKET

PORT	NO. OF MEASURE-MENTS	AVE. FISH TEMPERATURE Deg. C	FISH TEMPERATURE RANGE Deg.	C	AMBIENT (AIR) RANGE Deg. C
Peterhead	132	1.8	0.0-	7	11.5-14.0
Fraserburgh	149	3.9	0.5-	10.5	9.0 -10.0
Aberdeen	103	4.3	1.0-	11.0	10.0-18.0
Grimsby	321	4.9	-0.5-	13.5	10.0-20.0
North Shields	202	5.0	0.0-	12.0	10.3-17.5
Kinlochbervie	44	5.5	2.0-	11.5	13.0-16.5
Hall	162	5.7	0.0-	12.0	12.5 16.0
Lowestoft	116	5.7	1.0-	14.5	12.5-16.0
Newlyn	70	6.4	1.0-	12.5	15.0-22.7
Plymouth	104	6.7	0.5-	13.5	13.0-19.6
Brixham	323	8.5	0.0-	20.0	13.7-18.7
Bridlington	62	9.8	0.5-	17.0	14.0-18.0

Average Fish Temperature at all ports = 5.9 deg. C

3 PORT MERCHANTS

Removal of fish from the market and delivery to the port merchant is the responsibility of the merchant or his agent.. At most ports the majority of fish is removed from the auction hall more or less immediately after the auction, and delivered to the merchant using flat-bed vehicles. The use of these open vehicles is not a problem (in respect to temperature control) as in most cases journey times are only a matter of minutes and ease of access for loading and unloading at the market and at the merchants premises is an advantage. For longer journeys they are unsuitable. The practice of leaving fish on the market long after sale is inadvisable although it unfortunately occurs to some extent at most ports, particularly during periods of heavy landings when facilities are stretched. Certainly uniced fish was observed on Grimsby market during the survey up until 2.00 p.m. on one occasion, at which time it averaged 10.6 deg. C in temperature.

Of some significance in relation to the overall time-scale of distribution is the time that it can take to overland fish from some Scottish ports to merchants on the Humber or elsewhere for processing. Appendix 2 provides detail of the distribution of whole fish consigned on a Thursday from Kinlochbervie on the West Coast to two Hull merchants monitored by recorders.. The fish was sent by different routes; the first consignment arriving Saturday morning and the second on the following Monday morning. In each case the temperature control cannot be faulted, even for the first leg of one journey, which was by a flat bed vehicle. In the second case however the fish has been in transit for 4 days and in either case the fish probably will not reach the retailer until at the earliest Tuesday. On consumption that fish is likely to have been a week in the distribution chain from the time of landing.

Less efficient examples of temperature control in the overlanding of fish were encountered during the study. One consignment of fish from Amble to Grimsby averaged over 10 deg. C on arrival at Grimsby in a temperature range 5 to 13.5 deg. C having been sent with no ice on a flat bed vehicle.

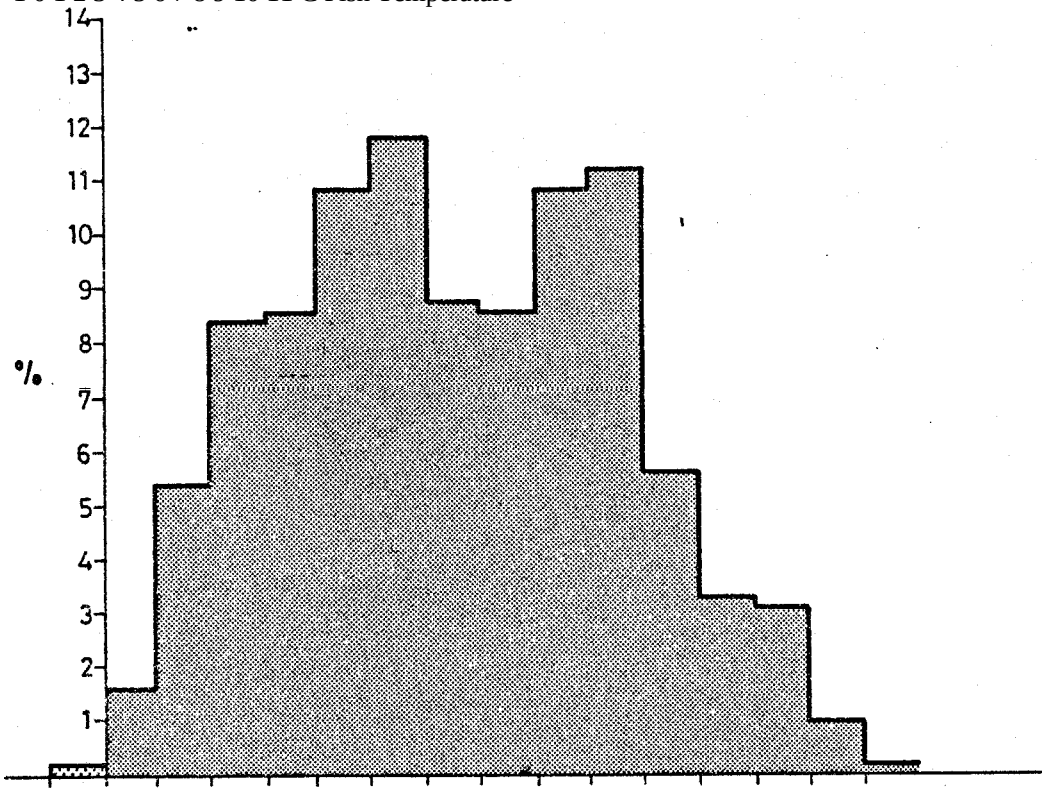
On reception at the merchants premises fish should be unloaded without delay, re-iced if necessary and stored in chill if not required for immediate processing. This practice however is by no means common and frequently boxes were observed piled high at the filleting bench waiting to be processed.

The average temperature, calculated from some five hundred measurements, for all ports combined, of fish prior to filleting was found to be 6.3 deg, C. The distribution and range of temperatures is given in Figure 2. Merchants were visited at each of the ports listed in Table 1 and temperatures were -recorded immediately prior to filleting through the morning and early afternoon. Temperatures of fish after the filleting operation (both hand and machine) prior to packing and icing calculated from a similar number of measurements were found to average 10.3 deg. C indicating a temperature rise through the process of 4 deg. C (average). The distribution of fillet temperatures is shown in Figure 3. In the case of the hand filleting opeation much of the warming is caused by heat transfer from the water in the fillet bench troughs, which is usually supplied direct from the mains. Temperatures of trough water ranged from 6.5 to 17.7 deg. C and averaged 13 deg. C. The rise in temperature of any individual fish depends on its immersion time in the trough which can be a matter of a few minutes, to as long as 30 - 45 minutes, assuming fish is not left over break periods, etc. Machine cut fish surprisingly were found to warm as much as hand cut fish on average but generally within a tighter band of temperature increases. The warming of machine cut fish is probably a combination of heat transfer from the water sprays within the machines and general heat gain from the surroundings during the proces of heading, filleting, skinning and trimming.

The practice at some small merchants of dragging fillet benches out onto the pavement or forecourt so that filleters can enjoy the sun while working can be condemned on both grounds of temperature control and hygiene.

Average Fish Temperature 6.3 ° C

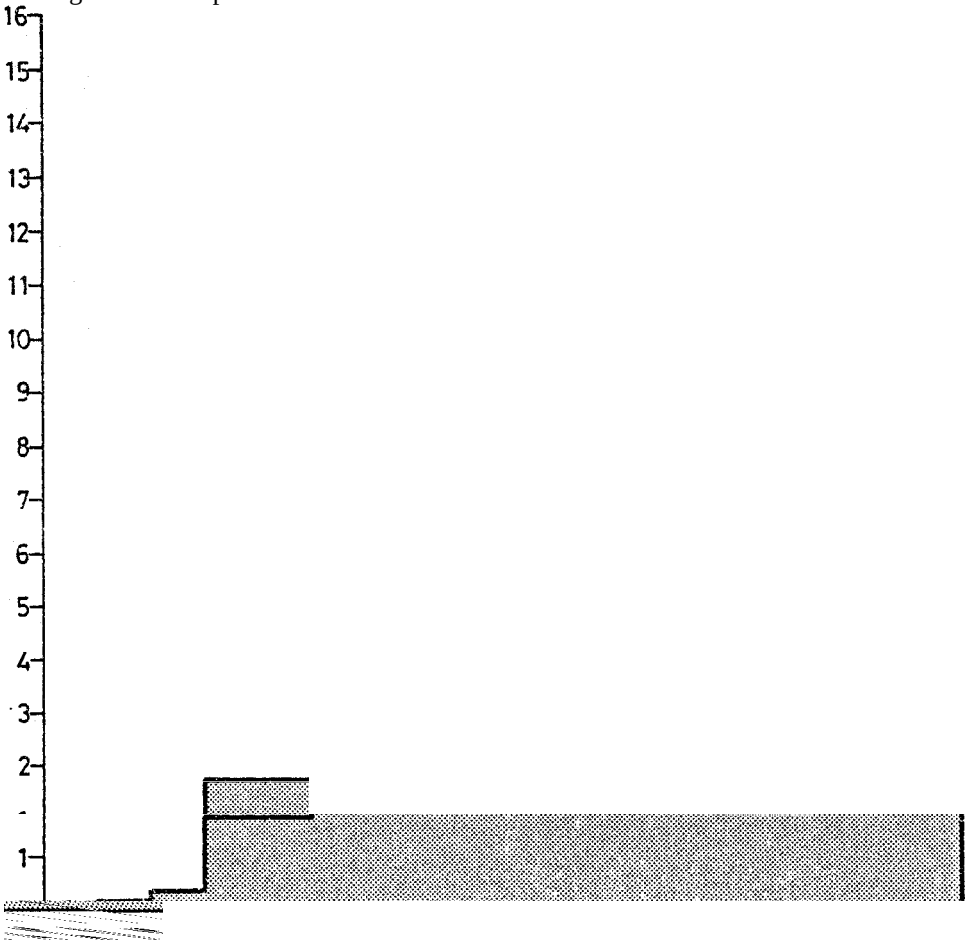
-1 0 1 2 3 4 5 6 7 8 9 10 11 C Fish Temperature

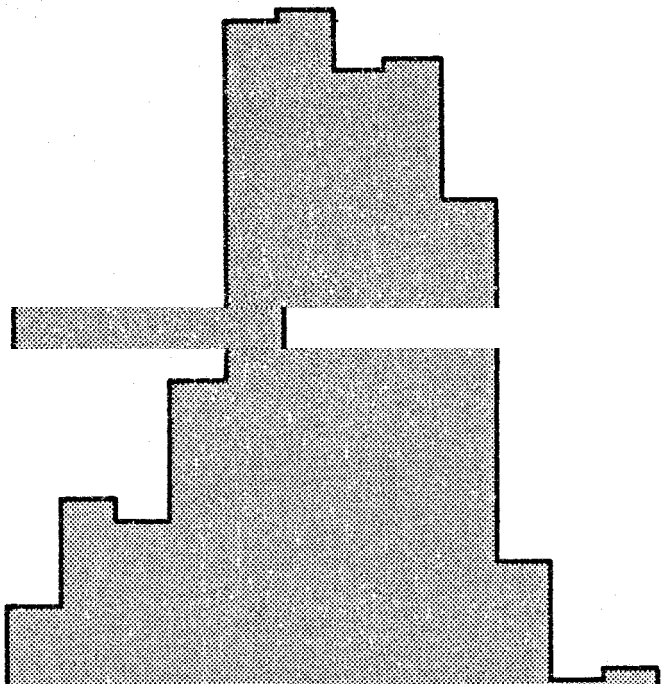


12 13 14

Distribution of Fish Temperatures Immediately Prior to Filleting Fig 2

Average Fillet Temperature 10-3®C





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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 C Fillet Temperature

Distribution of Fillet Temperature Prior to Icing and Packing Fig.3

Subsequent to cutting, fillets are weighed, packed and iced into non-returnable boxes for onward distribution usually secured with twine or tape strapping. The most popular sizes being 2, 1 and 0.5 stone boxes made of waxed cardboard, plastic or moulded polystyrene. It is common practice to ice only on top of the fillets and to place a film of clear plastic over the fillets prior to icing. A thorough evaluation of fillet boxes and icing practice is currently being undertaken by the SFIA (see reference 4). The initial results of this work suggests that the commercially available designs are in one respect or another inadequate for the duty they might have to perform, in terms of thermal or physical protection. Fish is a poor thermal conductor and it takes time for the applied ice to cool through a layer of fillets. For quicker cooling of fillets Torry Research Station (see reference 5) advise icing top and bottom of the box, particularly for the larger sizes of boxes. This practice does not seem to have been adopted by the trade and no port merchant was observed during the survey to ice in this manner.

The total period of time from landing to dispatch from the merchants premises varies enormously. Ideally fish would be landed in the early hours of the morning, auctioned that same morning and be filleted and dispatched by the early afternoon; a total of something like twelve hours. In fact the period is known, in some cases, to be as long as f ive days. Although the extreme quoted may not be common, icing back and holding overnight is common and in some cases necessary to overcome problems of production scheduling and imbalances between daily supply and orders. Imbalances can be caused by the effect of bad weather on fishing or by the tendency of the fleet for much greater landings towards the end of the week. This is well illustrated by Appendix 3 which is reproduced from Fish Trader, September 10th 1983. Fish may also be held overnight or over the weekend to enable filleters to make an early start, if fish is not immediately available from the market, in order to meet dispatch times of transport companies. It was difficult in the survey to accurately quantify the effect of holding fish over. When merchants were asked how much and for how long was fish carried-over the replies were less than candid. If asked if their fish supplies were of sufficiently good quality to overcome production problems by holding-over the replies were often more realistic. One such reply was: "Oh yes, superb stuff we can keep it five or six days, sometimes".

When icing-back there is sometimes a preference for crushed block-ice, where available, in preference to flake which is said to melt too quickly. It could be argued however that the quicker melting of the flake ice is caused by better contact with the fish thereby providing a more efficient cooling of the fish while it lasted. Part of the problem of loss of ice in the chill store is that the stores are often run inefficiently. Survey of 32 chill store temperatures gave an average operating temperature of 6 deg. L in a range of 1 to 17 deg. e. Often doors are left or wedged open for ease of access through the day and only closed-up over night. Although this practice is not to be recommended, plastic strip curtains would help minimise air exchange where continua? access is required to the store.

4 DISTRIBUTION - PORT MERCHANT TO INLAND WHOLESALER

Factors affecting the temperature of fish on the journey from port merchant to inland wholesaler are:

a) type of fillet box
b) size of fillet box
c) amount of ice used in the box
d) the manner of the application of the ice
e) ambient temperature
f) type of vehicle or vehicles
g) time of journey
h) position of the box on the vehicle
i) efficiency of any transfers

Initially it was attempted to evaluate the effect of these factors by placing temperature recorders in fillet boxes, but it was soon apparent that this approach was impracticable. The logistics of entering and recovering enough recorders to provide sensible analysis was beyond the resources of available labour and time. There were also problems of changing the conditions that we were attempting, to monitor. In some cases the boxes under study were known to receive preferential handling on route or better than normal icing prior to despatch. Additionally the recording devices were relatively bulky and placing them in fillet boxes necessitated that either less fish or ice could be contained therein, which then no longer made them typical boxes.

It was therefore decided to adopt an alternative approach and record the temperature of fish on arrival at the wholesale market, ma::ing note of the type of box, size of box, position on lorry, etc. In total over 1,500 measurements were taken at Billingsgate, Manchester and Birmingham markets. The average temperature of fillets on delivery for all types of boxes and vehicles was found to be 3.6 deg. C.

Tables 2A, 2B and 2C give the average temperature of fillets with reference to the type of fillet box, source of origin and to the type of delivery vehicle. Comparison is limited to some degree

by the interaction of the factors mentioned above but is considered nonetheless valid. In terms of thermal protection there would appear to be little difference between waxed card and plastic fillet boxes both being significantly inferior to the moulded polystyrene box. Analysis by source of origin tends to reflect the distance, and the type of transport that predominates at a port, with Lowestoft standing out as being poor based on the

evidence of the survey. None of the British ports approached the temperature control of Danish imports to Billingsgate via Harwich.

Table 2A

Material of Fillet Box	Ave. Fillet Temperature deg. C
Waxed Card	4.1
Plastic	4.0
Moulded Polystyrene	2.7

Table 2B

Source of Origin
Ave. Fillet
Humberside & N.Shields Milford Haven
South West Scotland Lowestoft Denmark (via Harwich)
Temperature deg. C 2.9
3.0 3.5 3.9 .
0.6

Delivery Vehicle
Table 2C
Ave. Fillet
Temperature deg. C
Refrigerated Insulated only Covered but not Flatback lorry
insulated
0.5 2.8 4.3 4.5

With regard to the type of vehicle used, refrigerated transport was, as would be expected, superior to all else. Average temperature of fillets delivered by refrigerated transport was 0.5 deg. C compared with 2.8 deg. C for insulated (but unrefrigerated), 4.3 deg. C for covered but uninsulated and 4.5 deg. C for flat bed vehicles. The average figures however tend to understate the problem, hiding far greater temperature variations. Thermal protection is provided by a combination of the presence of ice and the thermal properties of the box and the vehicle. While the ice remains the fillets receive cooling but as soon as the ice melts then the fillets gain heat from the surroundings. Insulation and refrigeration help in the first instance to prolong the cooling by the ice and secondly will inhibit the heat gain and temperature rise should the ice melt. Table 3 gives the maximum temperatures and the percentage of fillets, within each type of transport, over 10 deg. C. Although the average temperatures for covered but non insulated transport and flat back vehicles was 4.3 and 4.5 deg. respectively (Table 2C), it can be seen from Table 3 that approximately ten per cent in each category was in fact over 10 deg. C with maximum temperatures of 20 deg. C and 16 deg. C respectively.

_Table _3 Maximum Temperatures and the Percentage of Fillets tiithin Each Category of Transport at 10 deg. C or Above

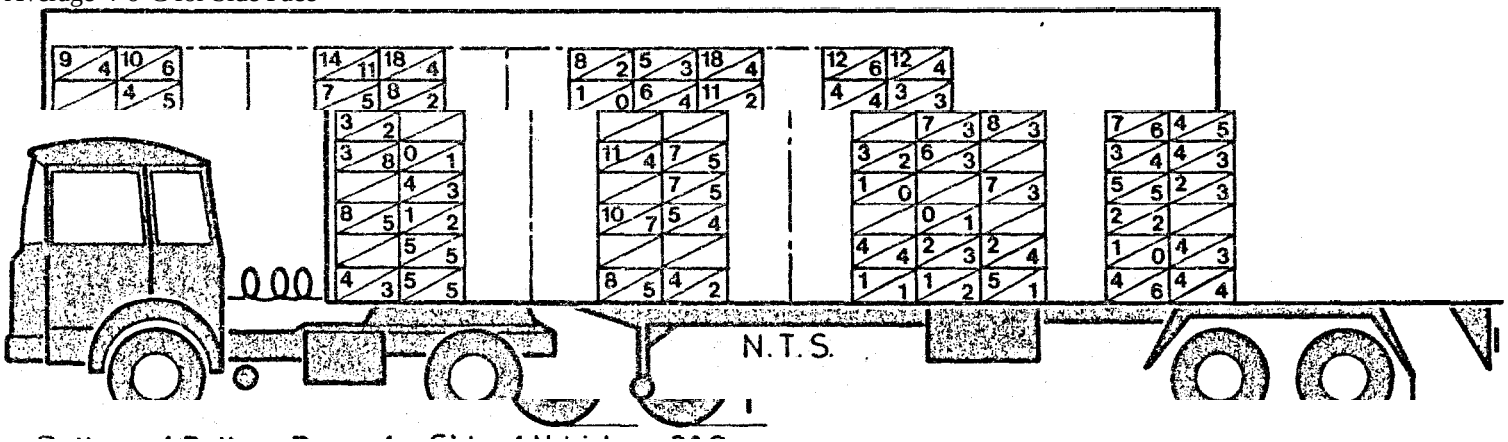
Type of Transport	Percentage of Fillets at 10 deg. C or above	Maximum Temperature deg. C
Refrigerated	None	2
Insulated	2.7%	14
Covered but not insulated	9.5%	20
Flatbed	10.0%	16

The boxes that suffer greatest from loss of ice and high temperatures are generally those with a face or faces exposed, particularly the top boxes, on flatbeds and non-insulated vehicles. Figure 4 illustrates this point and shows the temperature of fillets delivered by a sheet-sided vehicle (Tautliner) from Aberdeen to Billingsgate. The temperatures were measured on arrival early in the morning, (03.30 hours) and might be expected to rise slightly by time of sale. It is obvious from the temperatures of fillets upermost in the top boxes that the ice has been lost and that the fillets are gaining heat from their surroudings. This is most noticeable for the top boxes at the side of the vehicle. These boxes which have both upper surface and side exposed averaged 12 deg. C towards the top of the box.

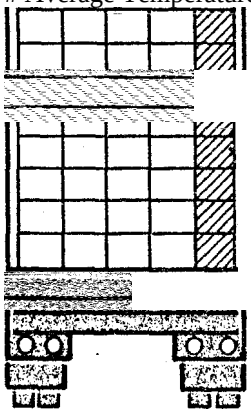
Ambient Air Temperature-16°C

Average Temperature Top of Top Boxes for Side of Vehicle - 12 `C

Average-4-6°C for Side Pace



Average Temperature Bottom of Bottom Boxes for Side of Vehicle - 3' C

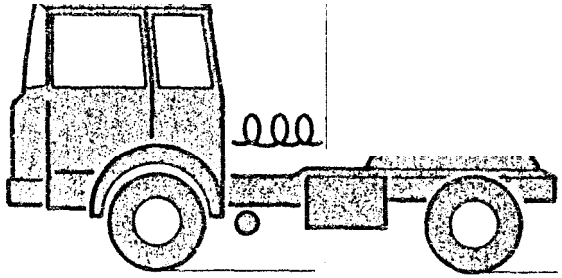


X - temp.top of box

Y - temp. bottom of box

Average Temperature Top of Top Boxes for Mid Position in Vehicle - 6°C

2



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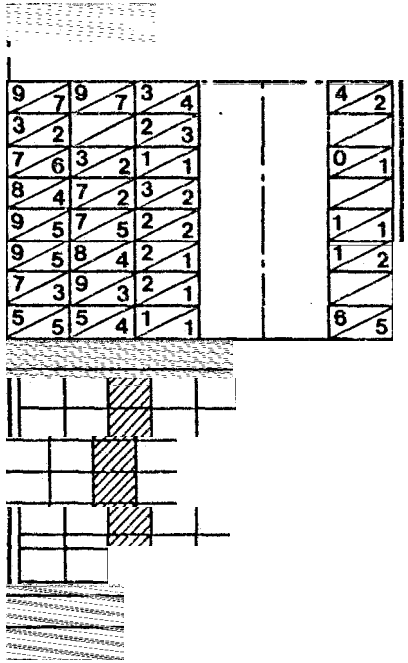
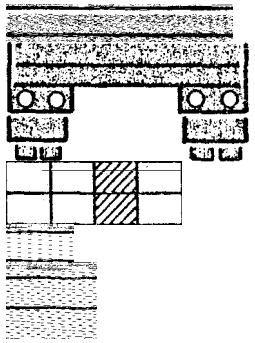
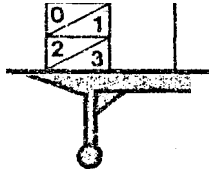




VIA



N. T. S. ae , ~"~s,

* Average Temperature Bottom of Bottom Boxes for Mid Position in Vehicle - 3 ° C

5 DISTRIBUTION - PORT MERCHANT DIRECT TO RETAILER

Most port merchant associations run, or sub-contract to, a transport company for purpose of delivery to customers. Grimsby is typical in this respect operating a transport department consisting of eleven trunker vehicles and seventy-three secondary distribution vehicles. The trunker vehicles deliver fish in bulk to depots throughout the country where it is transferred to the secondary distribution vehicles for delivery to customer. The service operates five days a week. The network of trunker and secondary vehicles is a consequence of the large number of customers (mongers, supermarkets, fryers, restaurants, etc.) that take relatively small quantities of fish (typically 2 to 6 stones per drop). For the purpose of study the distribution from Grimsby into the counties of Essex, Suffolk, Norfolk and Cambridgeshire was investigated. These counties are served by a depot at Bury St. Edmonds from which three 5 ton flat-back secondary distribution vehicles operate. The trunker vehicle, which is insulated, delivers into the depot between 23.00 hours and midnight having departed Grimsby by 19.00 hours in order that the secondary distribution vehicles be away between midnight and 01.00 hours. The secondary vehicles deliver to the customers premises in the early hours of the morning taking approximately seven hours to complete their run, making drops throughout that time. Delivery into the depot and subsequent deliveries to customers was observed on three consecutive nights covering the three distribution routes from the depot in turn. on the first two nights temperatures were taken on delivery to the depot and on delivery to the customer noticing ambient temperature and details of the box and reception facilities. on the third night individual boxes were identified on delivery to the depot and followed through to three customers with a return visit to the customers premises later to check temperature changes.

The average temperature of fish delivered into the depot on the three nights surveyed was found to be 0.2 deg. C but within a range of -8.5 to +10.5 deg. C with approximately 35% being frozen or partially frozen (below 0 deg. C). Ambient temperatures on the nights in question varied between 11 and 14 deg. C. It would appear from the results that some merchants are partially freezing the boxes of fillets in cold store prior to despatch in order that they survive the methods of distribution and facilities for .reception. Slow freezing in the cold store and thawing during distribution however is likely to result in quality problems of excessive drip and tough texture. The average temperature on delivery to customer was found to be 3 deg. C. Average temperature by six or seven o'clock in the morning is likely to be a little higher however as the deliveries are made throughout the night to premises that provide no chilled or even insulated reception for the fish. Most provide no security either. Table 4 gives detail of the observations of part of the third nights deliveries when specific boxes were identified and temperatures recorded on delivery to depot, on delivery to fishmonger and again some time after delivery to fishmonger. On average the fish gained temperature during the secondary delivery at a rate of +0.7 deg. C/hour.

TA13LE 4 TEMPERATURES DURING SECONDARY DISTRIBUTION TO RETAILERS

Primary Vehicle

Insulated Van (8 ton)

Secondary Vehicle

Open Flat Bed (5 ton)

Depot - Bury St. Edmonds

(1st September 1983)

Arrival Time - 00.05

Transfer Time - 00.10

Departure Time - 01.15

Start

Fishmonger Box Detail	FILLET TEMPERATURES. DEG. C. At Depot	At Fishmonger	Later At Fishmonger
f(Time-hrs)	(00.25)	(03.00)	(04.00)
Waxed card	5.0	4.3	5.5
1 stone			
Supermarket	0.6	2.5	3.:1
Cambridge	2.0	4.8	6.2
Corrugated	3.2	3.6	4.9
Plastic 2 st.			
	(00.30)	(06.00)	(07.30)
f(Time) Waxed card	--5.2	-1.8	-1.0
Supermarket A J 1 stone			
Colchester 11 Waxed card	-5.7	-2.7	-1.0
_ stone	-5.7	-2.7	-2.1
(Time)	(00.35)	(06.15)	(07;10)
Supermarket B i~ Waxed card	-4.0	2.4	3.6
Colchester 0.5 stone			
4!	--5, 1	-2.8	0.7
	1.4	2.6	3.3

Comments
Boxes placed on steel covered floor
of loading bay at rear of store.
No chill facility for reception. No security.
Ambient temp. 11.7 to 14.0 deg. C.
Boxes placed on wooden pallet at rear of store
No chill facility for reception. No security.
Ambient temp. 11.9 to 14.00 deg. C.
Boxes placed on wire trolley at rear of store.
No chili facility for reception. No security.
Ambient temp. 11.8 to 14.00 deg. C.

6 INLAND WHOLESALE MARKETS

It has been estimated (see reference 6) that 35 to 40% of all fresh fish passes through the inland wholesale markets that therefore form important centres of trading and distribution. Market hours are normally early in the morning, typically 05.30 to 09.30 hours with deliveries into the market being made overnight. Much of the business is conducted during the first few hours with retailers collecting fish for their daily business. Friers and caterers often require that their orders be delivered and this is usually undertaken with transport organised by individual merchants. There would appear to be little cooperation between merchants with respect to deliveries, operating in virtual isolation of each other.

Most markets operate a form of sale by sample whereby a relatively small number of boxes are opened and displayed for inspection by the buyers. At Billingsgate for example as little as 25% actually passes into the market hall with much of the fish in practice being sold from the car park. A survey of 1500 fish temperatures at Billingsgate, Manchester and Birmingham markets, of fish delivered into the market building showed an average of 3.5 deg. C in a range of 0 to 14 deg. C. A survey of 30 sample boxes opened and on display however averaged 8.1 deg. C largely due to the heating effect of the lights used on the stands.

How much fish is carried over from day to day at the inland markets is difficult to assess other than to comment that it is probably not a large proportion of the total volume. At many markets chill stores and ice are available for holding over although they are often in short supply or unavailable during summer months when needed most. Certainly at Billingsgate boxes of fish and fillets were observed in the afternoon on most days during the survey stacked within the market hall presumably awaiting sale the following morning.

Vehicles used in the delivery or collection from the wholesale markets varied, with small fiat beds, pick-ups and vans being prominent. Very few vehicles were insulated or refrigerated.

7 RETAILER

As part of a national survey of fresh-fish quality (Reference 7) unannounced and undisclosed calls were made to retail outlets and purchases of fresh cod and haddock were made during the months of July and August. Upon purchase the temperature of the fish was recorded and later the fish was assessed for freshness at the SFIA Advisory Inspection Service mobile laboratory. Details were also recorded as to the type of display facility and the efficiency of icing. Approximately one thousand samples were taken from five hundred outlets of various types.

Results of the survey relevant to temperature control are shown in Tables 5, 6 and 7. Table 5 shows the average fish temperature and the range of temperature for each type of retailer. The combined average temperature for all types of retailer was found to be 11.3 deg. C in a range -2 deg. to +24 deg. C. The first column of Table 6 shows the percentage of retailers of each type that use ice to maintain chill temperatures and keep the fillets moist (excluding C.A.P. fish). The second column shows the percentage that apply the ice efficiently: that is with some ice mixed or covering the fillets. The percentage of all outlets that use ice was found to be only 22% and of these only 7% were considered to be icing efficiently. Table 7 compares the fish temperatures displayed in chill cabinets, refrigerated slabs and unrefrigerated slabs with and without ice. Chill cabinets were more effective than refrigerated slabs which were in turn more effective than unrefrigerated slabs. Even when used with ice however samples from chill cabinets averaged 8.2 deg. C. In fact the use of ice with slabs or chill cabinets made only a few degrees difference on average which is a measure of the inefficiency of its application. Less than 2% of the mongers visited in an earlier quality survey (Reference 6) had their own ice makers.

With regard to holding over of unsold fish it was again difficult to assess either the amount or timescales involved. Previous surveys (Reference 6) showed that most retailers would admit to holding a small amount overnight if they did not sell out, but

the practice is known to be more prevalent than acknowledged. Some retailers only take deliveries twice or three times a week, particularly the grocer-mongers that deal in small quantities. Examples were also found of fish being sold as 'fresh' (wet) with cold storage flavours indicating that it had at some time been frozen and then thawed.
In an effort to minimise the holding-over of fish near the end of its shelf-life some retailers will reduce prices or sell off as
Mobile traders sometimes have an arrangement
with a fryer to take any surplus at the end of a round. Mobiles, having no fixed location, presented difficulties of assessment and it should be noted that the number of measurements was only eleven from a total of eight traders. The fact that only three of these were found to use any ice however gives rise for concern as temperatures in closed vans can rise alarmingly, although it is not apparent from the limited results. Food hygiene regulations exist (Markets, Stalls, and Delivery Vehicles, 1966) that set standards for mobile trading but they are interpreted and enforced (or not) by local authorities with varying degrees of tolerance. One Authority is known to insist that mobile
temperatures below 1 deg. C. There is strong interpretation and enforcement of regulations
It would also be of national association addressed. The only
collective organisation of mobile traders known is that which represents the port of Grimsby which in cooperation with the Port Health Authority sets and maintains standards of operation of its members.
pet food to clear.
traders maintain argument that the
be realistic and consistent nationally. benefit if there existed a register or through which mobile traders could be

Table 5 Retail Display Temperatures

Outlet	Average Display Temperature	Range of Temperatures
Mobile*	6.0 deg C	0.5 13.0 deg C
Supermarket C.A.P.	7.6	1.0 18.5
Supermarket Wet-Bar	8.7	1.0 17.5
Grocer-Monger	9.7	-0.5 22.5
Fishmonger	12.3	-2.0 24.0
Market Stall	12.7	1.0 20.0
Frier-Monger	13.0	6.5 19.5

Overall ave. display temperature 11.3 deg. C Overall range of display temperature -2.0 to 24 deg. C * See note in text regarding numbers

Table 6 Efficiency of Icing

Outlet	% of Outlet _Using Ice ~~ 93	% of Outlet Icing Efficiently 27
Mobile	38	38
Market Stall	24	24
Fish Monger	23	7
Grocer-Monger.	11	4
Frier-Monger	5	0

of all outlets using ice on display - 22% of all outlets using ice efficiently - 7%

Table 7 Temperatures of Display with Reference to Display Facility

Display Facility	Average Temperature-	Range of Temperatures	
Unrefrigerated slab without ice	14.0	1.0	23.0
Unrefrigerated slab with ice	11.1	0.5	20.5
Refrigerated slab without ice	10.8	0.5	18.0
Refrigerated slab with ice	9.5	3.5	24.0
Chill cabinet without ice	8.7	-2.0	19.0
Chill cabinet with ice	8.2	1.0	16.0

(Excluding C.A.P. and mobiles)

8 CONSUMER

To complete the chain of fresh fish distribution the practices of the consumer were investigated by inclusion in an omnibus survey commissioned by the SFIA. Relevant results of the survey are shown in Appendix 4. It showed that over thirty per cent of fresh fish purchases were held unrefrigerated until consumption which was usually on the same day of purchase. Thirty-one per cent of all purchases however were held for over six hours and nine per cent for periods in excess of twenty-four hours. Investigation of the performance of domestic refrigerators (Reference 8) further showed an average operating temperature of 4.9 deg. C.

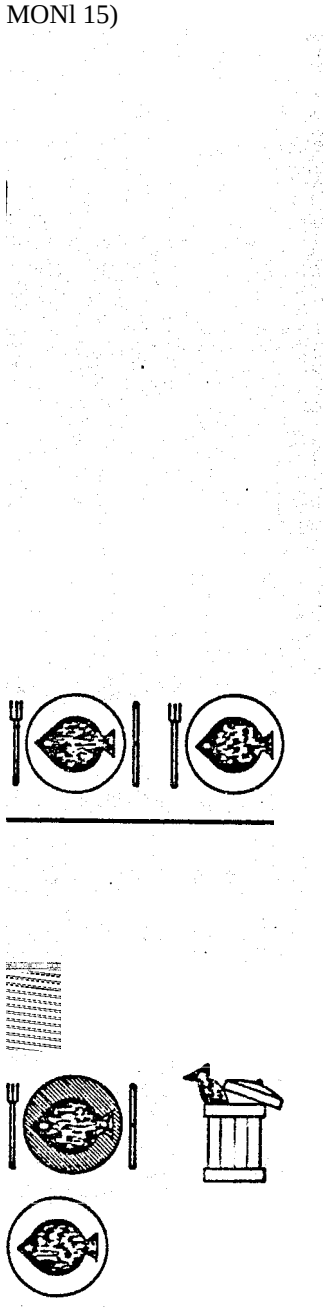
9 DISCUSSION

It is generally appreciated by the industry that the spoilage of fish is dependent on temperature and that the higher the temperature the faster the spoilage. It would appear however, from the results of the survey, that it is not appreciated just how critical and how sensitive the spoilage is to even relatively modest temperature increases. Figure 5, which is reprinted from T.R.S. advisory note 3, illustrates the effect of cooling on the keeping quality of cod. An increase from zero to five degrees centigrade reduces the shelf-life by approximately seven days.

Days Old

.. .. SAT WED 6 10

MONl 15)

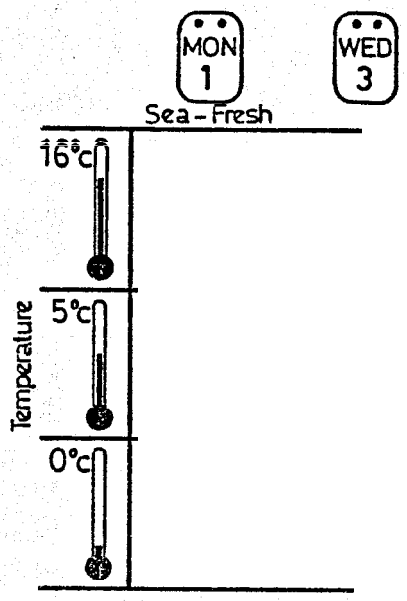


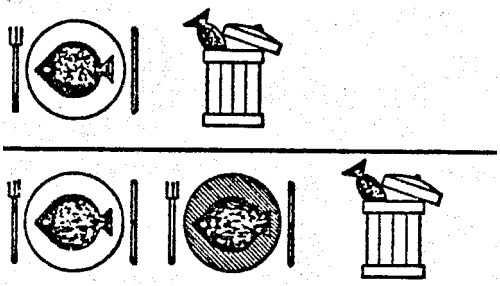
Effect of Cooling on the Keeping Quality of Cod.

Fig.5

Source: TorryResearch Station

Fish held at sixteen degrees centigrade has a total shelf-life of only two days from capture to consumption.

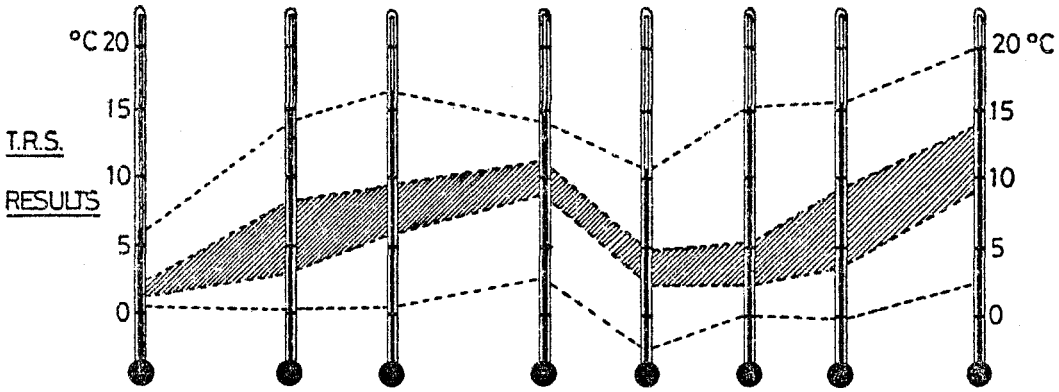




The result then of poor temperature control during the distribution of fish, particularly as observed during the initial and final links in the chain is obvious: good quality fish is ruined or downgraded. Loss of fish quality is also attributable to delay in the chain and it is the authors impression that the average time from landing of fish at the quayside to eventual consumption must be in the order of 'three or four days.

Given the timescale and staffing available to undertake this survey there are naturally limitations both in scope and in depth to the work but it is interesting to compare the results with the earlier and more comprehensive work by Torry Research Station conducted in 1956/7 (see reference 3). Figure 6 represents the findings of the T.R.S. survey and compares them with the findings of this study. Within the hatched central band lie fifty percent of all the TRS measurements. 'The findings of the SFIA are not dissimilar to those of T.R.S. with average temperatures mostly within the range of values quoted by T.R.S. The maximum values however were in some instances in excess of those encountered in the T.R.S. survey particularly on landing and auction. This may be accounted for partly by the fact that 1983 was a hotter summer
also by the inclusion in the later study of the South-West that were found to be regard to icing practice at sea. (See
than those of 1956/7 but of Bridlington and ports particularly poor with Table 1).

SEI.A.	landing and	port merchant		delivery to	delivery to	display at
RESULTS	auction	before filleting	after filleting	wholesaler	retailer	retailer
maximum	22.7 °c	14.5°c	16.4°c	20.0°c	10.5°c	24.0°c
average	5.7	6.3	10.3	3.6	0.2	11.3
minimum	-0.5	-0.5	1.5	0.0	-8.5	-2.0



unloading
auction before
boxing rail inland at display
filleting and terminus market shop
icing
Comparison of SFIA Survey with TRS Survey of 1956 l7
Fig.6

Although the results of the two surveys are not dissimilar there have been however great changes within the industry since 1956/7. The most significant being the demise of the Humber-based distant-water fleet and the growth of the inshore Scottish fleet. The quality of fish on landing should in comparison be better because of the shorter trip lengths made by the inshore vessels. The smaller inshore vessels however are more susceptible to poor weather conditions which can lead to an irregularity of supply which is further aggravated by fleet sailing and landing practices. As a consequence mongers and wholesalers have to hold-over fish in an effort to overcome imbalances.

The current over capacity for processing on the Humber (or lack of available fish) and under-capacity in Scotland, a reflection largely of the fleet changes, has led to an increased trade in overland supplies of whole fish to the Humber for processing and distribution. In some instances however it was found to take four days from landing for fish to reach Humber merchants. Development of processing facilities in Scotland will probably see this overland trade shrink due to the poorer economics of sending whole fish compared with fillets. The current strength of the Humber merchants is their, customer contacts and an extensive, direct delivery network compared to Scottish distribution into England which is largely to wholesale markets or merchants. It is possible that the future could see the strengthening of the provincial inland merchants particularly if they can develop their distribution networks.

There have also been changes in transportation, from rail to road and in the retail sector. There has been a reduction in the number of traditional fishmongers and an increase in mobile retailers and supermarkets dealing in fresh fish, reflecting changes in shopping habits.

So although there has been considerable change recently in the practices of the industry it would appear that the consumer probably has not benefited from any significant improvement in the quality of fresh product.

Advisory notes issued to the trade seem to have had only limited impact and effect, and what legislation that does exist is directed to consideration of health hazard and not quality of product. This is in contrast to Denmark, where the fishery is of greater national economic importance, and comprehensive legislation exists and is applied for the purpose of maintaining and further raising the quality of fish. it is considered unlikely by the author that the SFIA could obtain similarly comprehensive legislation for the purpose of quality improvements though some tightening of standards might be possible by a stricter and uniform application of powers given to local authorities under various Acts.
A fundamental. problem for a fragmented and conservative industry is that there exists a lack of immediate financial benefit to be derived from investment for quality enhancement. Until and unless retailers demand and are prepared to pay for improvements and changes in existing practices it is un-likely that significant quality improvements will be achieved.

10 CONCLUSIONS 10.1

For fresh fish it is likely that the actual period elapsed from landing of fish at the quayside to consumption is in the order of three or four days. It is further liekly that the average loss of quality through poor temperature control during those days is equivalent to at least a further four days deterioration compared with what it might have been had it been kept at zero degrees centigrade. The combination of these effects results in fish on consumption being the equivalent on average of seven to eight days storage at 0 deg. C plus whatever age on landing. In simple terms landings of good quality fish are ruined or downgraded in the distribution chain.

10.2

The faults do not lie entirely in the chain of events from landing onwards. A contributory cause of delay is the uneven landings of fish caused by fixed weekly patterns of sailing and landings, which require port merchants and wholesalers to hold fish over.

10.3

The efficiency of icing at sea, which determines the temperature of the landed catch, for boxed fish was found to vary between ports and vessels within any port fleet. Of the ports surveyed the Scottish ports were generally identified as being the most proficient.

10.4

Facilities provided for display and auction at most ports are poor in respect of temperature control and efficient box handling.

10.5

The practice at the ports landing bulk or shelf stowed fish of displaying fish for sale with no ice, due to its being removed during grading ahsore, is harmful to fish quality.

10.6
The elapsed time at some ports between the start of the discharge of vessels and the time of auction is excessive in some cases and leads to prolonged periods of unprotected display on the market for the earliest landed fish.
10.7
In some cases there is considerable delay in removing boxes from the market hall. after the auction.
10.8
Evidence exists that would suggest there are serious problems of delay and/or temperature control of whole fish being overlanded to the Humber from Scotland and the smaller ports of Yorkshire and Northumberland.
10.9
There is a significant rise in temperature during the process of filleting.
10.10
It would appear that some merchants are partially freezing boxed fillets in an effort to overcome the inadequacies of temperature control in the distribution network allowing them to thaw in the process of delivery. If the freezing is achieved slowly in the cold store prior to despatch this practice will lead to problems of excessive drip and tough texture.
10.1.1
Commercially available fillet boxes are inadequate for the duty they might have to perform in terms of thermal or physical protection given existing distribution methods and timescales involved.
10.12
Polystyrene fillet boxes are far superior to waxed card or plastic in maintaining chill temperatures.

10.13
For primary distribution (port merchant to depot or wholesaler only refrigerated vehicles provide the conditions which ensure and maintain satisfactory temperature, control for all the fish carried.
10.14
Flatbed vehicles for secondary distribution (depot or wholesaler to customer) provide no thermal protection whatsoever (other than that provided by the box and ice), and as they are used for journeys of up to eight hours duration they cannot be recommended.
10.15
Reception facilities for deliveries made at night to premises of retailers, caterers, friers, etc. that provide means of temperature control are almost totally lacking. (They are also found lacking in respect of hygiene and security.)
10.16
The unavailability or shortage of supply of ice during summer months at some wholesale markets is acute and some loss of quality must result through poor icing practice, either in icingback or adding for onward distribution when necessary.
10.17
The highest temperatures and rate of fish spoilage in the distribution chain were found to occur during display for sale at retail shops.
10.18
Display facilities, refrigerated or otherwise, at retail shops offer inadequate temperature control, even with ice, unless the ice is applied efficiently. Only 22% of displays used ice and only 7% used ice effectively. An insignificant percentage of retailers have ice makers.

10.19
There is generally a lack of motivation to invest for the purpose of quality enhancement.

11 RECOMMENDATIONS 11.1
That the. SFIA continues with the preparation of voluntary Codes of Practice with the aim of setting realistic standards to which the industry may aspire.
11.2
That the SFIA liaises with retailers, retail associations, caterers and institutional buyers to produce purchase specifications that include and define practices of handling, packaging, icing, transport, etc. as defined or developed from the Codes of Practice. The intention being to impose standards back down the chain and reward those that meet the standards and provide a better quality of product.
11.3
That the SFIA provide an advisory service to retailers or caterers, as required, to assess the quality of supplies and to investigate standards of practice of suppliers.
11.4
That the SFIA liaises with government and local health authorities regarding the interpretation of existing legislation and the development of new legislation with the intention that agreed uniform standards be applied nationally.
11.5
That mobile traders be encouraged to form a national association possibly from an expansion of the existing Grimsby Mobile Fish Retailers' Association that represents its members interests so effectively. A national association would not only act for the common interest of members and provide the usual trade benefits of group discounts etc., but assist in setting standards of. equipment and trading, and open a means of communication to an expanding retail sector.

11.6
That current SFIA investigation of commercially available fillet boxes lead to the specification and development of a range of fillet boxes that provide improved thermal and physical protection suited to existing distribution practice.
11.7
That the SFIA undertake development work with view to improving the temperature of display cabinets used by retailers.

APPENDIX 1

Extract from Fish Trader Article on SFF Forum, Anstruther May 1983

Inland wholesalers were represented by Manchester merchant Martin Sykes, who complained:

"We cannot get deliveries of good fish on Monday or Tuesday and or. these important days for us we are having to put up with fish being landed on Thursday and Friday and being carried over. I have to buy from abroad to carry my business over this shortfall."

He was referring to landings he handles from Peterhead. Fish which reached him from there was ending up in shops, such as in Cardiff, the following Wednesday. Why was he not able to get quality fish earlier in the week?

A skipper replied by claiming that what Mr. Sykes had said was a heap of rubbish. He maintained that for the past five years he had worked Sundays, and that he landed quality fish at Peterhead on Saturday, Sunday and Monday. He then went on to claim that what the industry needed was TV promotion of fish and, in the absence of government money, it should be generated from within the industry.

Good Fish

After a second skipper declared that Mr. Sykes was talking nonsense, Mr. Sykes replied:

"I have visited Peterhead and seen good fish but I'm a merchant in Manchester and as such I'm telling you the service that we get - and that includes a load of fish offered on a Saturday morning which we cannot sell until the Tuesday.

"I have assumed that this fish was landed in Peterhead on the Friday, but if you tell me that you are landing good fish on Monday and Tuesday, is it possible that on a Friday we are receiving a backlog of fish from the "in-between" merchants that was in fact landed on the Tuesday?

"As a Manchester merchant of some experience I assure you that the first day of the week that I am happy with Peterhead fish is a Wednesday."

Mr. Sykes then stated that he had in fact visited Peterhead four weeks earlier, when he was impressed with the landings, but not by the movement of fish unstacked and on open-topped flat lorries.

"More harm can be done to fish in the first hour ashore when handled in this way than at any other stage in its lifetime," he remarked. "I dread to think of the problems that sunshine creates."

Mr. Sykes said that the fish he transported from Peterhead was in refrigerated vehicles, but these vehicles could not cure quality problems which had already been created.

"Why don't we stop knocking the foreigners?" he concluded. "Why don't you use deeper boxes, but first, go the markets like Esbjerg and see what they do. The speed and efficiency with which they handle ten times the fish entering Peterhead has to be seen.

"Don't knock these foreigners - go and see what they are doing and then try to up the standards in your own port to match theirs."

John Adams, the retailer on the panel, mentioned that he had received fish from Morocco a few weeks earlier - fish which had been flown into Paris in 10 kilo boxes and then from Paris to London, then transported to Cardiff for him to receive via his local merchants. The fish was worth 50p per pound but sold at 21.80 per pound because it looked magnificent.

"It is a nonsense that I am able to sell this magnificent fish
flown from thousands of miles away and at the same time have rubbish offered me that was literally landed on my doorstep," said Mr. Adams.

"Is it always the merchant's fault? Do we handle our fish properly? If skippers are landing the fish in the best possible condition, they must be seriously looking at what is happening between their vessel and my shop."

John Adams was reminded that he had been asked to visit Peterhead
the previous year after he had addressed the fishermen, and he then in return reminded the fishermen that he still awaited the
actual invitation.

Standards

Ken Beeken, speaking for coastal merchants, considered that things were not as bad as painted. If merchants were guilty of bringing in fish through cheap channels and sending out rubbish, the obvious answer was that fishmongers should avoid them in the future. He considered that in truth it was a question of everybody improving their standards down the line.

An Aberdeen merchant then threw a spanner in the works by declaring that he had known rubbish to be sent to Manchester and Liverpool which had been readily sold,. and that on other occasions the cream of fish had been sent to Manchester, Liverpool, Birmingham and Leeds where it had been held over for three days before finding a market.

Ken Beeken retorted that it was absurd for fishermen to make the suggestion that merchants deliberately held fish, and he maintained that was the function of a merchant to turn fish round as soon as possible.

Surplus

Mr. Sykes stressed he was anxious not to create a slanging match. What the industry had was a problem of surplus at the end of the week, he believed. Too much fish on a Friday resulted in it being held over for four days before it could be offered for sale in the shop. If the supply situation could be evened out, the problem would be reduced.

"The best fish in the world can take four days to get to the customer. This is something we should not be proud of. Surely this is why we are here to try and solve the problem."

A fisherman then attacked the fishmongers with this extraordinary statement: "You fishmongers should say to yourselves 'Listen lads, we are in fishmongering so if we get fish on a Friday, Saturday or Sunday morning we must go into work."

The fisherman was applauded for that absurd statement by his fellow skippers, who seemed unaware of the fact that a fishmonger works all Friday and Saturday (his best selling days) and cannot work on a Sunday by law. A fishmonger does not in the main work on a Monday because the public are not prepared to shop on Mondays in most towns.

A fishmonger would dearly love to only open on a Thursday, Friday and Saturday, the three days of the week when the public seriously buy anything of any type. This happens to be the national buying pattern, and fishermen will have to learn to live, as has the retailer, with the facts of life. Fishing is no exception: it has to cope with a ,buyer's market and the public does not give a damn about buying any goods that are not available on a Thursday, Friday and Saturday.

Raymond Fraser of Peterhead Fishermen's Co-operative said: "When Peterhead fish is landed and sold it is the best you can get. One of the basic problems arises as a result of the fact that much of this fish remains lying on Peterhead market until 7 p.m. at night. It is iced but nonetheless in many cases it is then eventually transported from the quay on a flat wagon.

"There are too many people handling fish who have no interest in how they handle. it. It does not belong to them so they don't care. What we need is more fish processed at Peterhead itself, and I am pleased to hear that grants and loans may be available to potential processors in the future.

"All. fish transported from Peterhead should be in refrigerated vehicles. The chain after Peterhead must be looked at. I have followed fish down to Grimsby from Peterhead and I have been appalled at its condition on arrival."

This commensense contribution by a responsible official at Peterhead virtually endorsed the criticisms made by the Manchester merchant and John Adams, but the fishermen present did not seem to take his message on board. Perhaps it was because he too ended by saying something rather extraordinary: "Possibly the fish merchants and fishmongers should work as hard to put the fish through the chain quicker."

Hours

The fishmonger is at the end of the chain and he is selling, as explained earlier, all hours he can afford to stay open. Fishermen should appreciate that fishmongers are not going out of business through reducing their sales hours - quite the contrary. It is having to stay open for five days and employ staff even for two days a week when sales do not remotely cover their costs that is causing many fishmongers to go out of business."

SFIA chairman Philip Rettie did not seem to agree with Mr. Fraser's main point. He maintained that the Authority had studied the transport systems and was satisfied that fish left Peterhead in good condition and arrived at ports such as Grimsby in good condition. In his opinion the trouble started from thereon.

He agreed that there was a need to generate more processing at Peterhead itself because the trouble started when fish got to the second wholesaler.

Ken Beeken defended Grimsby by insisting that the problems that
were being highlighted were small in relation to the total movement of fish.

"Grimsby is a buoyant market, and within 24 hours fish that entered it was either in another market or at a shop as far afield as Cornwall by 6.30 or 7 p.m. the next day," he said. "Processing at ports is reducing because of lack of continuity of supply.

"Since the demise of the distant water fleets, large processing plants have had to close but as a port we do shift fish as quickly as possible through the plants that exist. If this
meeting thinks that the future lies in moving bases for processing - remember the fillets deteriorate a lot faster if they travel long distances as fillets."

Of course insulated containers would improve the transportation between Peterhead and Grimsby but that costs money and may be worthy of SFIA funding.

As stated last week Fish Trader queries the claim that Peterhead f ish eventually sold through Grimsby is better for having been transported to Grimsby in the gutted whole condition. We have seen beautifully graded Norwegian fillets that have been transported to Manchester in a container and which reached a Cardiff retailer 48 hours later in perfect condition with ample ice remaining in the container. If this fish had been handled in the manner Mr. Beeken suggested, the transportation costs would have been double from Norway, and we submit that the end product would have been poorer once processed.

The secret of success of the Norwegian product we quote as an example was that no hand had touched the fish from the time it left the processor until it was opened by the retailer.

The final question concerning marketing that was presented by a fisherman was: "Why don't merchants work unsocial hours like fishermen by starting markets at 8 and 9 p.m. in the evening?"
Absurd
Ken Beeken quickly dealt with that absurd question by confirming that many processors did work unsocial hours and that there was
little point in starting a market at 8 p.m. if it would not speed up the time that the same fish ended up on the fishmonger's slab.
The remainder of the meeting was focused solely on internal problems facing our fishermen.
We trust that this attempt to faithfully reproduce the content of the meeting - which in many cases was not related even remotely to marketing - will illustrate that there is a wide gap in the understanding between sections of the industry.
Many of the fishermen's questions were at best naive in the extreme.

APPENDIX 47

Details of Fish Overlanded from Kinlochbervie to Hull

Fish landed Kinlochbervie Thursday 21st July. Whole fish packed in seven stone wooden boxes.

To Processor 'A' Hull	To Processor 'B' Hull
Recorder packed into fish 19.45	Recorder packed into fish 22.00 Thursday 21st July and into lorry, Thursday 21st July
Vehicle - flatback lorry	Vehicle - insulated and refrigerated wagon
Position of box - top box of 4 to the side of load, third box from rear. Load covered	Refrigeration switched on prior to loading at 21.45 Doors closed 22.30 by tarpaulin
Lorry departs for Aberdeen 22.10 on 21st July	Lorry departs Friday evening 22nd July
Load transferred at Aberdeen to Tautliner vehicle for onward delivery to Hull	Lorry routed via: Carlise Fleetwood Hull
Delivery to Hull processor 'A' 06.15 on Saturday 23rd July	Delivery to Hull processor 'B' 06.00 on Monday 25th July
Temperature in transit. never above 1.5 deg. C	Temperature in transit a constant zero degree centigrade

APPENDIX 48

Extract from Fish Trader on Uneven Landings at Peterhead, September 1983

The total amount of fish landed in Peterhead last week looked very healthy: 48,317 boxes. But nearly two-thirds of these were landed on the last three days of the week, so we had a shortage on Monday, Tuesday and Wednesday, and an abundance of fish for the remainder of the week.

At the beginning of the week therefore staff were being sent home early, while towards the end of the week merchants were having to pay overtime to clear fish.

There has been a fair quantity of fish going to fish meal, mainly owing to landings being uneven.

For the last three months the quality of fish landed has left much to be desired. We know that part of the problem is fish spawning and feeding, but surely there must be more reasons why the fish are continuing to be of poor quality.

Withdrawal

It seems that because of guaranteed withdrawal prices the boats are catching large quantities of fish and not clearing their decks before taking another catch abroad - and therefore not getting the,fish gutted, iced and below as they normally would.

Prices of certain fish have varied by as much as E10 per box from the beginning of the week. Cod landings have' been in short supply and therefore prices have remained high over the past six weeks.

Christmas and New Year holidays were discussed, and the market will close from December 24, 1983 until January 4, 1984.

There was trouble over the last Saturday morning landing (August 27) when merchants arrived and found a full market which appeared to represent about 7,000 boxes. The agreement in the past has been that only 6,000 boxes would be landed.

Matters came to a heat; when one transport company refused to lift
any boxes after a certain amount of the market had been cleared; approximately 6,000 boxes.

Considering that 90 per cent of the merchants in Peterhead now have strong feelings for complete Saturday morning closure, surely the Harbour Board's policy not to close will have to be reviewed. Certainly it does not make sense to land over the agreed number of boxes.

Perhaps if there were no Saturday landings we might get boats having to change their mode of sailing, and instead of the fleet leaving for sea on Sunday midnight we might see boats sailing throughout the week, therefore getting even landings.

A meeting is to be organised between the harbour trustees and the North-East Scotland Development Agency to try to influence two processing firms to expand in Peterhead. A new car park opposite the fish market has made life much easier for merchants and visitors.

APPENDIX 50
Customer Practice
Based on Omnibus Survey by Gallup Poll Ltd. February 1983. Total sample of 891 persons of which 585 purchased fresh fish.

1.
How long after you have bought fresh fish do you usually keep it in the home? Is that in a refrigerator or not?

	% Refrigerated	% Unfrefrigerated
Under 6 hrs	40	27
6 - 12 hrs	12	1
12 - 24 hrs	8	1
24 hrs plus	9	0
Varies	2	2

2.

Why do you not keep your fish in a refrigerator?

No refrigerator	5
Tainting of other food	11
Not necessary	40
Cooked and eaten straight away after buying	33
Other reason	3
Do not know	11

3.
How long after you have bought fish is it before you get your fish home?

Less than	1 hr	38
1 -	3 hrs	9
3 -	6 hrs	0
over	6 hrs	0
Varies		52

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SFIA Technical Report No. 211 - Handling and Holding Practices in the Production and Distribution of Fresh Fish and Their Effect on Quality, March 1983

7

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SFIA Technical Report No. 231 - Quality Evaluation of Fresh Fish at Retail level, November, 1983

SFIA Internal Report No. 112 - Temperature Performance of Domestic Refrigerators in Summer Months, September 1983

9

SFIA Internal Report No. 1096 - Investigation of Fish Box Weights, April 1983

3. All resources of the Irish Sea, and any other areas accessible to the fleet, should be carefully managed by taking as broad a view as possible to ensure maximum benefit is obtained. Regularity of supply is important to maintaining the viability of existing processors and encouraging the establishment of new processors. This is particularly true of the species of whiting and cod, as well as prawns, and excessive landings elsewhere in the UK of these species can adversely affect the price structure and stability of the Northern Ireland market.
Overfishing of smaller whiting in the Irish Sea, especially as a by-catch of the prawn fishery, should be avoided and research into selective trawl gear initiated to see how this practice can be prevented.
4. There is a need for better treatment of fish on board to improve quality on landing. This includes better standards of guttingi more rapid handling and stowing the catch and wider use of ice. The latter problem is mainly due to a shortage of ice production in Northern Ireland and Government help should be sought to increase ice production, not only for the catchers, but for the distribution trade as well. The same attitude to quality and treatment must be reflected through the distribution chain.
5. Finding and developing new market opportunities regulating supply with demand should be an essential part of POs work. This may involve buying and selling fish functioning as a co-operative organisation within interpretation of the EEC Council Resolution No. 3796/81.
and the and the

The Processing Sector

6. The processing sector must also achieve unified representation through a strengthening of the Northern Ireland Fish Processors and Exporters Association and strive for a 100% membership. Mobile Traders should be encouraged to form an association and develop uniform standards of quality and service. 7. Processing of fish in domestic premises at Portavogie should be discouraged by offering traders proper facilities within the harbour area, but ultimately, by enforcement of the health regulations relating to food preparation, should this be necessary.

b. Northern Ireland processors should develop the production of added value products such as frozen whiting fillets, breaded fillets and combination recipe products. These could be marketed both in Ulster and the UK mainland.

9. Increased fishing activity off the north coast in Area VIa and VIb will necessitate provision of a harbour of refuge on the North Coast. This requirement is compatible with the need for increased onshore processing for pelagic fish on the west coasts of the British Isles. The SFIA are studying the requirement for pelagic processing plant as a separate exercise in association with the Ulster Polytechnic. A computer model has been developed which examines the profitability of several types of processing plant. This model can be used by DANI, the LEDU, the IDB and processors to decide on the most appropriate plant for the area.

Organisational Structures and General Comments

10. The powers of the Northern Ireland Fish Harbour Authority (NIFHA) should be widened to control the first sale of fish and ensure that all fish is sold openly whether through auction or contract sales. The timing of the auctions at the main ports should be in the interests of all concerned and independent fishsalesmen should be employed.

11. NIFHA should take all necessary steps to ensure the completion of the market auction hall at Portavogie before the summer of 1984.

12. The consumer and catering markets in Ulster and the Republic of Ireland, together with the production of new products for export, offer a better long term opportunity for the Fish Industry's development rather than relying on existing links with the English and Scottish coastal markets.

TECHNICAL REPORT NO: 204

A BUSINESS STUDY OF THE NORTHERN IRELAND SEA FISH INDUSTRY

SUMMARY OF FINDINGS AND RECOMMENDATIONS

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A BUSINESS STUDY OF THE NORTHERN IRELAND SEA FISH INDUSTRY

1. INTRODUCTION

The Northern Ireland Study is one of a series carried out by the Sea Fish Industry Authority which attempt to bring the regional problems of the UK fisheries into perspective. The study is carried out under the 1983-84 MAFF Commission.

This particular study examines the catching sector of the Northern Ireland fleet which has increased rapidly in recent years in terms of numbers of vessels and total landings and is now facing severe economic difficulties. It also deals with the infrastructure and the means by which fish caught by Northern Ireland fishing vessels is sold and disposed of. An important part of the report deals with the organisational framework at both Government and Association levels.

There are two companion studies which are to be taken into account. A retail and catering consumer survey for Northern Ireland was commissioned by the SFIA and is summarised in this report. Another report in the course of preparation, describes a computer model of a processing factory located on the North Coast of Ulster, which could create new opportunities for the fishery.

The field work was carried out between November 1982 and January 1983 and included interviews conducted with a wide cross section of the Industry representing catching, marketing, processing, distribution and retailing. Invaluable assistance was given by the Department of Agriculture for Northern Ireland, both during the study and in a review of the draft report.

The report makes several recommendations but also provides as accurate picture of the Fishery as possible at the present time, and as such, will assist the SFIA and others to discuss the regional problems of Ulster with respect to fleet development, training and marketing of fish more effectively.

2. THE CATCHING INDUSTRY IN 1983

2.1 The Fleet

In early 1983, the fleet consisted of 158 vessels in excess of 12m (40ft) in length:

5 purse seiners

123 trawlers mainly engaged in nephrop fishing typically of 150-250hp

30 large trawlers engaged in either pair or single boat trawling typically of 450-550hp.

In addition there is a unique fleet of 60 skiffs engaged for part of the year in the Mourne herring fishery and an unspecified number of small boats (less than 12m) engaged in small scale fisheries along the Antrim coast.

The fleet is substantially centred at three ports along the County Down coast south of Belfast Lough, namely Portavogie, Ardglass and Kilkeel. Relatively insignificant quantities of fisa and shellfish are landed north and west of Belfast along the Antrim coast. The five large purse seine vessels registered in Northern Ireland do not normally land there. There have been quite recent exceptions, however, when in late 1982, over 9,000 tonnes of mackerel were landed at Londonderry for onward transportation to the Republic of Ireland, and more recently several pursers engaged in trawling for white fish, landing their catches at Kilkeel.

It is estimated 80% of the fleet work daily trips into the North Irish Sea from the County Down ports. An industrial fishery for sprats and herring was built up in the 1960s to provide raw material for a fishmeal factory at Mornington, County Louth, (near Newry), but this establishment has since shut down.

In 1982 the value of landings in the three main ports were estimated at:
Ardglass£1.0 million Kilkeel £4.5 million Portavogie £3.0 million

2.2 The Prawn Trawlers

The 123 prawn trawlers operate, in the main, a daily fishery and land the prawns* and whiting by-catch each weekday evening.

In February and March many of these boats change over to the North Irish Sea spawning cod and whiting fishery and in June and August some of the vessels engage in pair trawling for herring during the Manx season.

when prawn fishing, the fishing grounds may be as close as 30 minutes from harbour but normally not more than three hours away. If the prawn fishery is off St. Bees Head, in Cumbria, landings may be made at English or S.W.Scottish ports. There are peaks and troughs in the availability of prawns throughout the year, these are presumably due to the movement of the prawns into deep water or due to unusually deep burrowing at certain times of the year.

Catches of prawns from January to September 1982 exceeded the similar period in 1981 by about 6% and catch rates increased from 8kg/hour to 9kg/hour, but this is mainly due to landing a smaller size of prawn than in previous yars. By the end of 1982, the total landings of prawns were 4,488 tonnes valued at £3.49 million. Kilkeel is the main prawn port on the Co. Down Coast.

The prawn trawlers have relatively low operating costs due to a combination of small engines of less than 250hp, low towing speeds and short steaming distances to and from the fishing grounds.

* Prawns are the common name appplied to Nephrops norvegicus

Prawns have always provided high value products and, at least until 1979-80, commanded an attractive price to the catcher compared to operating costs. Demersal fish were relegated to a by-catch status and as such were not given proper care and attention. A collapse of the market for prawns in 1979-80 somewhat altered the picture and subsequently, demersal fish has become relatively much more important to the catchers. A study of typical costs and earnings shown in Table 5 indicates that the prawn catch alone barely covers operating costs. The by-catch of demersal fish is essential if the vessels are to make a profit.

Justifiable criticism of handling practices and the poor quality of landed whiting, is undoubtedly due to the attitude by some crews to the. by-catch. Prices have always been near minimum for whiting and, unfortunately but understandably, crews have felt that the use of ice, particularly in winter, and careful handling of. these fish, was not justified. It is, of course, a fact that small whiting taken with a prawn catch will suffer some damage due to abrasion with prawns and other debris within the codend. Prawn trawling does result in considerable amounts of mud and seabed debris being accumulated in the codend and tows are often of three or four hours duration with the footrope digging into the mud. Due mainly to the low towing speed of 2 knots and lack of trawl headline height, the majority of whiting taken are in the smallest EEC size grade 4 category, especially during the peak prawn catching season in summer. Significant quantities of large whiting in better condition are taken as a by-catch with lower winter prawn catches. In the bycatch perhaps 20% of size 3 are taken but it is local practice to sell both 3 and 4 as size 4.

The reason given is that local processors prefer to mix the grades to simplify bonus payments to filleters. In these circumstances there is no incentive to the fishermen to grade
to EEC standards.

Another practice is to land 'rounders' or ungutted whiting. These are preferred by hand filleters as they give a better yield than badly gutted whiting. Nevertheless, this can cause accelerated bacteriological spoilage with time, but is probably not a real problem if filleting takes place on the same day as capture. It is unfortunate that this practice can cause discoloured fillets. The main reason why landing of 'rounders' should be discouraged, is that in times of glut landings, fish, which are roughly tipped into boxes and not handled on board properly, are likely to be inadequately iced. Gutting small fish at sea is time consuming, especially if the prawn catch has to be sorted and headed. There is also a practical problem in that a prawn trawler usually only carries a crew of four. Consequently, any improvements in gutting and grading will only be brought about by the buyers and processors demanding higher standards from the prawn trawlers and matching these demands with financial incentives for improved standards.

observations of fish on the quayside indicated variations in the standards of gutting of white fish with some fish badly cut and retaining viscera. It is obvious from recent trends in the marketing of whiting within Ulster, however, that this fish must be presented in the most advantageous manner on the quayside to

trawlers. The

attitudes to The time is to be gained to be frozen

compete with fish now being landed by pelagic

availability of good whiting has apparently changed the marketing of this species in Northern Ireland. ripe for a new appraisal of the advantages in price from quality improvement, particularly if fish are down for further processing,

2.3 Pelagic Trawlers

Pelagic trawlers normally land daily or every two days and sometimes may land midweek at a S.W. Scottish port and return at the end of the week to Northern Ireland. These vessels normally fish within a fairly restricted area of the North Channel between the Mull of Galloway and Rathlin Island. This is an area of deep

gullies and strong tidal streams. For these reasons it is not generally suitable for bottom trawling, especially by low powered vessels.

In the Clyde the use of the pelagic trawl for catching of white fish was pioneered for the taking of small saithe and it was seen that hake and cod could also be taken in significant quantities. Initially, one or two hour tows were yielding 2250kg (50 boxes) of cod or hake. The 1982 fishery was considerably less lucrative and recent fishing in 1983 has yielded catches of only 30 boxes of cod for a 12 hour tow and significantly lower hake catches.

These catch rates have to be considered along with the expensive towing costs involved since these vessels may often tow for 12 hours against a strong tidal stream. For engines in the 500 to 800hp range, fuel costs may be between £200 to £300 for each day's fishing. The trawlers have engaged in other fisheries, including pelagic trawling in the Minches and off Cornwall as well as cod fishing within the southern Irish Sea. The indications are that the concentrated effort within the North Channel is depleting the stock of white fish at an alarming rate.

In addition to the seasonal fishery for cod and hake, a considerable quantity of whiting of grades 2 and 3 are caught. Whiting caught by these vessels are clean inasmuch as they are not affected by debris, sand or prawns. Despite the fact that these vessels tow for 12 hours at a time, they command premium prices for all fish. The cod and hake is nearly all consigned to Ayr or Humberside but the good quality whiting has created new opportunities in the local market. Unfortunately, the whiting by-catch from the prawn trawlers is seen as poorer quality and does not seem to be benefiting from these opportunities.

Quality of the iced catch is generally good but the study team observed one or two exceptions. Part of the problem, at least, is the use of shallow 7 in. deep boxes. Not only were large fish crushed by the box above but these boxes did not

appear to have been really clean when put aboard. Whilst the shallow box is ideal for prawns, the use of plastic boxes of adequate depth must be recommended for large fish stowage, and cleaning of plastic boxes must be more effective. Boats consigning fish to markets where separate containers are used for display, tend to use deeper and more expensive plastic boxes because they can rely upon receiving their boxes back by return. This type of box is used universally by buyers shipping fish off the market where adequate icing is required for road transportation.

The harbours in the East Antrim, North Down area are attractive to the pelagic trawlers to reduce steaming time to the fishing grounds, and when it is required to lay up for a weekend. Several boats use Bangor and Carnlough Bay for convenience, although there are no ice supplies or other facilities in these places.

2.4 The Drift Net Fleet

The Mourne herring stock, which is a separate group from the Isle of Man stock, is fished by a fleet of small drifters known locally as skiffs. Trawl fishing is presently banned on this stock. There are about 15 of these skiffs in Annalong and another 15 or so between Kilkeel and Newcastle. Following the complete closure of the fishery between 1979 and 1981, this fleet was allocated a quota of 400 tonnes for 1982, which is taken from the beginning of September into October.

These fish are caught close inshore by boats of between 9m and 12m in length (30-40ft) each fishing 6 or 7 herring nets. Each boat is crewed by six men. One particular market for this herring is that of silver smoked marinated herring for Italy. A firm in Annalong processes, packs and ships, under the label of an old established Yarmouth firm.

3. THE FISH RESOURCES

3.1 Fish Landings

Demersal fish supplies landed by the Northern Ireland fleet accounted for 8082 tonnes in 1980. In 1981 this volume increased by 86% to 15,240 tonnes, and a further 13% increase in 1982 to 17,270 tonnes (Fig. 1 and Table 1).

From Fig. 2 it can be seen that the increase in demersal landings since 1980 of over 100% is due to an increase in whiting landings. The total volume of whiting landed in 1980 amounted to 4,000 tonnes, increasing to 9,000 tonnes in 1981 and 9,934 tonnes in 1982.

It is significant that this increase on whiting co-incided with the introduction of pelagic trawling by the Northern Ireland fleet.

Herring landings, Table 1, declined in the period 1980 to 1981 by 26% to 1,816 tonnes. During 1982 they improved slightly to 2,263 tonnes. Following an increase in fishing effort, landings of prawns increased by 47% between 1980 and 1981 to a total tonnage of 3,752 tonnes. This volume increase helped to offset the 6% decline in market prices. During 1982, landings of prawns have increased by a further 20% which, coupled with a 17% increase in average market prices, has made prawn fishing in 1982 a much more profitable operation. The majority of the increase, however, is attributable to a smaller size of prawn being landed and inevitably some degree of management of the stocks must be exercised if the resource is to remain healthy.

Cod is the other main species landed by the Northern Ireland fleet and these landings have shown a steady increase through the period 1980 to 1982. Landings in 1982 were 3,885 tonnes.

However, the prospects for 1983-84 are that there is likely to be less cod available due to poor recruitment to the stock in 1981

3.2 Prospects for Demersal Fish

In the prospects for 1983 (Ref.3) the following Total Allowable Catch (TAC) and EEC quotas for the UK in Area VIIa (Irish Sea) are given. To date these have not been applied.

	TAC	UK Quota
Cod	10,000 tonnes	6,400 tonnes
Plaice	3,500 tonnes	2,300 tonnes
Whiting	12,000 tonnes	9,600 tonnes
Hake	-	3,800 tonnes

The cod quota has been subjected to discussion and at one stage a quota of 3,200 tonnes was suggested.
In 1981 the UK catch and Northern Ireland's share in tonnes were as follows:

	1981 International Catch	1981 _UK Catch	1981 N.Ireland Catch	N.Ireland Catch as % of UK Catch
Cod	14,900	6,600	3,360	51
Plaice	3,917	2,355	132	0.5
Sole	1,640	400	41	10
Whiting	17,029	10,316	9,049	88
Hake	1,492	n/a	563	n/a

If the same percentages were applied to the UK national quotas, the total catch of these species by NI vessels would be about 12,000 tonnes compared to 13,145 tonnes in 1981 and 14,399 tonnes in 1982. The main loss would be the whiting catch which would require to be reduced to 8,500 tonnes. What is clear from the foregoing has been the dependence of the Northern Ireland fleet upon whiting in recent years, a situation which cannot continue.

One feature of the 1982 figures is the lower catch per unit effort (cpue) of cod. The catch rates of cod by a typical prawn trawler was down by 50% to 60% in
catch rates were down in 1982. This by a small fleet of Northern Irish into 1982 within ICES area VIIa, the of the pelagic trawling effort must
extremity of Area VIa, the North Channel between the Mull of Kintyre and the Antrim Coast. It seems probable, however, that this effort is recorded as VIIa as the there are no records of Northern Ireland vessels catching cod or hake within VIa according to statistics produced by the International Council for the Exploration of the Sea (ICES).
1982. Similarly, the hake catch was heavily exploited pelagic trawlers from 1981 Irish Sea. A certain amount be within the south eastern
Traditionally the fleet has concentrated on herring and latterly on the prawn fishery off County Down. Nevertheless, bearing in mind the limited quota and the declining catch rates indicated by the latest catch statistics, there would seem to be every reason to shift some fishing effort on to North and North West Coast grounds, ICES Area VIa. It is true that a combination of strong tidal streams and bad trawling grounds and the absence of a suitable harbour with fishing industry facilities on this coast make this area unattractive in comparison with the good trawling areas within easy reach of the Down Coast ports.
It is, of course, recognised that boats cannot be expected to move their base without having servicing facilities, and without a better knowledge of the fishing conditions in the area. To correct this situation would undoubtedly require some assistance from Government funds in order to carry out exploratory fishing.
The MAFF Fishing Prospects for 1983 (Ref. 3) indicate the following situation as regards Area VIa stocks (see Fig. 3).

Cod -

Haddock -

Whiting -

Hake -

Herring -

a reduction of 10% in catch was recommended by ICES for 1982 with possible subsequent reductions. similar recommended TAC reduction and unlikely to change substantially thereafter.
as for haddock.
no change for 1982 over 1981 but minimum mesh size of 80mm recommended for the whole of Area VI.
. no change 1981 to 1982, prospects for improved
TACs recommendations thereafter. The current 1983 TAC for the Minch Herring Fishery is 60,000 tonnes `of which the UK share is 40,000 tonnes,, The UK does not have a quota for the West of Ireland stock (i.e. west of Lough Foyle).
It must be borne in mind that Area VIa covers a huge geographical spread and it is believed that the overfishing indicated for cod, haddock and whiting is generally concentrated on the northern sector. This includes the NW Scottish effort around the Minches and the banks west of Orkney, also by Grimsby and French trawlers. Nevertheless, the quota for the whole area is affected.
The grounds lying between Broadhaven, Tory Island and Rathlin Island have in the past been worked by NI vessels as well as vessels from Fleetwood. In this area there is fishery by a fleet of some 40 boats from the Republic of Ireland, working in the vicinity of Greencastle, County Donegal. This harbour is situated just five miles inside Lough Foyle from Inishowen Head, almost directly opposite Portrush in Antrim. The resources fished by this fleet consist of a variety of marketable species including codling, haddock, skate and dogfish, in contrast to the more limited variety of species available off County Down.
The Greencastle boats leave the North Coast briefly at the beginning of February to engage in a short cod fishery out of Killibegs in Donegal Bay. The statistics for Irish landings of white fish from Area VIa, which is effectively from Broadhaven to Lough Foyle, reveal the following catches for 1981.

Cod 2,725 tonnes
Hake 27 tonnes
Haddock 1,891 tonnes
Plaice 464 tonnes Saithe 250 tonnes Whiting 8,148 tonnes Total 13,505

3.3 Prawn Prospects

Prawns are not subjected to a Total Allowable Catch (TAC) or a quota. During 1983, ICES are to have a stock assessment programme initiated. This work will eventually produce scientific recommendations for the management of the prawn stock and could conceivably recommend quotas or minimum mesh size regulations. In these circumstances, a minimum mesh size may be preferred as it is less likely to result in damage to the immature fish and reduce the landings of small prawns. For the present the available statistics on catch rates over. the year show seasonal variations in the average size of prawns and in catch rates but an increasing tendency to land more of the smaller in average sizes. There is very little overall change in the total abundance of the species, see Fig. 2 and Table 7.

3.4 Herring Prospects

The North Irish Sea herring stocks are strictly controlled and offer no oportunities for immediate expansion.

The Mourne stock off the Down coast is presently closed to trawling and is the subject of a 400 tonne quota for the local drift net boats or skiffs. However, an estimated additional 1,440 tonnes of this herring was taken as a by--catch in 1981 by boats fishing the Manx herring stock. The fishery takes place over a short period between the beginning of September and October.

The Mourne stock, has recovered as a result of the restrictions on fishing effort and particularly from the decision to limit access to drifters only.

The Manx stock is fished mainly by pair trawlers. The former fleet include boats from Ireland and Scotland as well as local trawlers. The fishery is now strictly licensed and is open -for a limited period during mid-summer from July. The timing of the fishery is a continued dispute with the Manx Fisheries Authorities. The Northern Ireland fishermen would prefer a later start to the season as there is a belief that the herring are in better condition for the market.

In 1981 UK vessels operated a quota system up to a limit of 3,800 tonnes for the season and the size of the spawning components off the Mourne and Manx stocks has, as a result, recently increased. This should eventually allow an increased quota but in the meantime, the present combined quota of 3,800 tonnes remains applicable.

Within Area VIa and eastward of 7°W, the UK quota for herring is 40,000 tonnes in 1983. Although of a small size, which is not preferred by UK processors, there is expected to be some improvement by 1985 provided the current measures of stock conservation are effective.

4. THE MARKET

4.1 Trends in Supplies

Market supplies of fish are dominated by prawns, cod and whiting. Since 1980 there have been rapid increases in landings of all these species. The reasons are simple. The improvement of world prices for prawns during 1981 and 1982 has encouraged expansion of this fishery whilst the growth of pelagic trawling, especially from Kilkeel, in recent years has resulted in increased landings of white fish.

Through 1981 the revenue associated with demersal landings did not maintain the same growth as the volume. The £1.4 million (59%) increase in earnings during 1981 (Table 1) corresponded to an 88% increase in weight landed. Due to the hardening of fish prices in 1982, this trend has been reversed with a 29% increase in revenue corresponding to a more modest 13% increase in landings during the same period (Table 1). Landings of whiting were particularly heavy during 1981 and 1982.

During the first nine months of 1982, of the three main Down Coast ports, Kilkeel emerged as the more important for demersal landings with a 64% increase in 1982 to 6,000 tonnes. This is about 1,000 tonnes more than that landed at Portavogie, but during the same period in 1981, Portavogie had the highest landings by some 1,400 tonnes.

With its large processing industry, Kilkeel is the major port for prawns and accounts for 61% of all prawn landings in Northern Ireland.

Ardglass has shown a decline in volume landed during 1982 of approximately 11% in both demersal and prawn landings, which are partly due to the inconvenience of port improvements being undertaken there and the decline of the herring fisheries. The restrictions on the herring fisheries since 1977 have caused a drastic reduction in herring supplies.

4.2 Species Mix

Analysing the total weight landed, the species mix for demersal fish landed showed the following percentage breakdown for the period 1980 to 1982.

	1980	1981	1982
Cod	32	22	23
Dog f i sh	4	4	6
Hake	1	4	2
Monk	3	2	3
Plaice	2	1	1
Whiting	49	59	57
Saithe	4	4	5
Other	5	4	3
	100	100	100

On an individual port basis the breakdown highlighted the following:

	1981	% of Total Kilkeel 1982	Landings 1981	in Ardglass 1982	Each Case Portavogie 1981	1982
Cod	66	70	13	8	21	22
Dogfish	7	16	17	23.	76	61
Hake	8	18	11	11	81	71
Monk	33	37	23	16	44	47
Plaice	57	69	14	10	29	21
Whiting	29	44	22	14	49	42
Saithe	25	29	20	8	55	63

The increased percentage of landings of all species on Kilkeel market has been quite marked in 1982 with cod, plaice and whiting dominant but this growth has been mainly at the expense of Ardglass.

4.3 Auction Price Structure

The auction price structure at the three fishing ports depends on the ability to distribute given species to market outlets both within Northern Ireland and to the mainland markets in the UK. With a limited demand in Ulster often supplemented by supplies from Scotland, the local prices have been very much at the mercy of the mainland supply situation. Heavy landings of whiting or prawns on the East Coast of Scotland or England can depress prices in Ulster irrespective of quality.

Unfortunately, in addition to the mainland supply position, the mobile trader, with lower overheads than processors, is undercutting the whole of the industry's market price structure in order to compete with the established trade suppliers. The mobile trader has the advantage of substantially low overhead costs in filleting and distribution. He is able to combine these advantages with the ability to buy fish at Portavogie quayside fish auction in direct competition with the coastal merchant. The fleet, who depend on the ability of the coastal merchant to periodically absorb large quantities of fish, particularly whiting, are forced to accept lower quayside prices (from the coastal merchant, who in turn has to compete with the mobile trader in the retail market.

Portavogie is normally the first fish auction on the coast, so any quayside price levels established at Portavogie set the price structure, especially of the main species whiting, common to all three ports.

Kilkeel, with its later start at the auction, is the port most likely to suffer from unsold whiting. It is estimated that the domestic demand for whiting in Ulster is a total of 1,500 boxes of whiting before the price structure is undermined. This level obviously varies depending upon the availability of whiting imported from Scotland. Consequently, during periods of heavy landings, the downward price spiral started at Portavogie

completely undermines the whiting price structure at Kilkeel, resulting in lower prices and unsold fish failing to reach the minimum withdrawal price.
The predominance on the Kilkeel market of cod, and the increasing importance for dogfish, plaice, monk and saithe, results from Kilkeel's growing distribution links with markets on the mainland, particularly in the NE of Scotland and Humberside.
The improved quality of white fish catches from the pelagic trawlers, compared with that from the prawn trawlers, has been a major factor in attracting the white fish buyers to maintain a more continued presence on the fish market at Kilkeel. This is reflected in the following price trends.

Port/	Kilkeel		Portavogie		Ardglass	
Prices	1981 £/tonne	1982 £/tonne	1981 £/tonne	1982 £/tonne	1981 £/tonne	1982 £/tonne
Cod	348	458	320	427	419	422
Dogfish	100	141	124	110	89	116
Hake	550	88.6	972	1053	674	922
Monk	323	282	437	326	300	346
Plaice	295	368	446	348	407	427
Whiting	158	187	70	219	184	197
Saithe	222	251	132	170	288	213

Portavogie is the main port for hake through links with Messrs. Hogg of Ayr and their connections with the Spanish market. Portavogie has also developed links with the Northern
Ireland market through Belfast
through mobile trader outlets. from vans direct to the public,
increased in number quite dramatically over the last twelve months or so, 38 mobile operatives were known to DANI at the end of 1981. The figure is now estimated as 64 and the numbers are still increasing.
wholesalers and, in particular, These fish traders are selling friers and wholesalers, and have

The inability to impose a minimum price scheme on all fish landed in Northern Ireland is due to a large number of boats not operating through Producer Organisations. Consequently, during periods of heavy landings, quayside prices can fall below the EEC official withdrawal prices. The associated inability of the fleet to operate any self control to regulate supply to demand stems largely from the freelance attitudes of many skippers, particularly at Portavogie. The refusal of at least 50% of this fleet to be members of either of the two Ulster POs prevents either PO from bringing any stability to the first-hand auction price structure.

The introduction of a large national fish merchandising company at Portavogie undoubtedly has established a major link with mainland markets. However, there is a need for the fish selling practices to more directly reflect the fishermen's interests by separating the buying and selling roles. The SFIA suggest licensed salesmen employed by the NIFHA would best serve the Industry's needs and create greater confidence in future development.

The inability of the fleet to present correctly graded, gutted white fish on to the market does result in a lowering of the auction price level, particularly for whiting. This is mainly a problem of the prawn fleet who treat the demersal catch as a by-catch of secondary importance to the prawn tails. The catching method with the prawn net generally produces a lower quality fish. This problem is particularly serious during summer months when prawn catches are at their maximum and whiting are generally all within the minimum EEC size 4 marketable range.

The EEC Regulations for the Minimum withdrawal Price Scheme (Ref 5) are administered by the PO's with the support of DANI. The scheme is safeguarded by the practice of withdrawing all remaining fish of a species size grade from sale once there is fish from that category unsold. The DANI inspector can intervene if the unsold fish is of poor quality and allow the sale to resume for the better quality fish of the same species. However,

this rule should be reconsidered since there is evidence that system depresses the price structure and good fish by-passes auction to be sold below minimum price simply to guarantee boat immediate cash payments for its fish.
the the the

4.4 Market Developments

The period since 1980 has seen a dramatic change in the pattern of fishing in Northern Ireland; the addition of new vessels and modernisation of the fleet with grant-aided investment has resulted in an increase in the catching ability of vessels and also an increase in the overall fleet size.

Unfortunately, the stocks available to the fleet were severely reduced with the imposition of restrictive quotas for cthe herring stock. Consequently the pelagic trawl vessels were forced to look seriously at demersal stocks as their main income source. The recent reopening of the Minch herring fishery in 1982 could create new opportunities. However there is an evident lack of UK markets for fresh herring of the size available and a shortage of processing capacity to make best use of this herring.

The introduction of pelagic trawling for white fish during the period 1980-82 provided the means to increase catch rates on existing grounds. It also enabled the fleet to exploit fishing grounds that previously were beyond its capabilities using the old fishing methods and brought particular benefits from hake catches.

The economics of operating the newer, larger vessels meant that these vessels, in order to meet increased operating costs, were forced to seek a much higher income base. With the seasonality of the more profitable species of cod and hake, and the limitation of the Irish Sea in terms of variety of species other than whiting, the latter has become the major target for the pelagic trawl fleet. Due to the low value of whiting compared with cod, etc., the fleet had to achieve its required income by increased volume of landings in order to produce an

adequate profit return. Consequently, whiting landings have increased from 4,000 tonnes in 1980 to nearly 10,000 tonnes in 1982.

The fact that the pelagic trawl fleet were landing a quality whiting, properly iced, and giving continuity to the market, has enabled the fleet to establish a growing demand from the Northern Ireland consumer market, particularly with the fish friers. Whereas this market has previously been mainly reliant upon supplies from Aberdeen, with local vessels supplementing supplies, the reverse situation is now the case. This development now provides the home fleet with a potentially strong home market and the possibility of a more secure financial base in the future.

A buoyant home market has also been developed by the mobile trader mainly operating from Portavogie. The extent to which the mobile trader has made inroads in to the home market is outlined in Fig.8 where it is estimated that 24% of the market share is supplied through this service (see also section 4.3). The wholesalers in Belfast, both within and ouside the Belfast wholesale fish market, appear to enjoy a 47% share of the market and coastal processors/merchants have the balance of 29%.

The role of the Belfast wholesaler is very different to that of a mainland wholesaler, in as much, as his trade is mainly conducted via the telephone with retail/frozen/catering outlets. Orders are transmitted back to suppliers in Aberdeen or. processors in Northern Ireland. On receipt of the prepacked fish, the wholesaler basically acts as a depot by providing the distribution to the ultimate customer. Consequently, the main fish distribution networks serving the consumer outlets in Northern Ireland revolve around the Belfast wholesaler.

The benefit of recent market developments is that the fleet has now a more reliable income base, less subject to the whims of alternative supply sources upsetting the price structure, as is experienced, for example, on Humberside markets. It is a

foundation which having been established should be encouraged and developed, not only by the pelagic trawl fleet, but also by the prawn fleet, by improving the quality of demersal fish landed by better handling to meet the standard required by the home market.

The coastal processor should be encouraged to develop a greater degree of processing ability to attract a greater variety of whole fish from home resources and from the mainland into the market system so that they can become the major suppliers into the wholesale market. The wholesaler in turn should be encouraged to develop the distribution system onwards into all possible consumer outlets.

The mobile trader, though he has undoubtedly broadened the sales area for fresh fish, has also unfortunately undermined the auction price structure through his ability to sell 'cheap' fish. This situation which, if not controlled, will become economically disastrous to all sections of the industry including the mobiles.

5. PROCESSING

The prawn stocks within the Irish Sea support a major processing industry. Capital investment, valued on current day costs, is in the region of £5 million, and there have been.major developments on the Down Coast to process added-value prawn products to satisfy demands from both the home and international shellfish markets.

Plants are located at Kilkeel and Annalong with five large processing factories compared to two in Portavogie. These processors, employing approx. 400 staff, require a minimum throughput of approx. 20 tonnes of prawn tails per week to remain economically viable, which when equated to 3,000 tonnes of whole liveweight prawn catch, is 67% of the 1982 prawn landings in Northern Ireland.

The maximum output of the prawn processing industry in Northern Ireland, including overtime production capacity, is estimated to be in the region of 5,500 tonnes (whole liveweight) or 28% of the total UK prawn landings in 1982. During 1982 it is estimated that 1,200 tonnes of scampi products were produced with a market value of about £5 million, 80% of which are breaded.

The continuation of the NI prawn industry is not only of major importance to both the social and economic development of Northern Ireland but also as a major contributor to the market development of the UK prawn industry. Consequently, every safeguard should be made to preserve and manage the stocks available to the NI industry and so ensure the future growth of the industry.

The processing of demersal fish is centred on Ardglass, whilst pelagic fish is processed in Ardglass, Annalong and Kilkeel. Kilkeel has now developed its bulk freezing facilties to such an extent that when combined with the facilities available at Arglass and Annalong, the overall processing ability

is quite capable of handling all the current landings of pelagic stocks of herring and mackerel from NI Vessels.
The seasonality of demersal stock supplies, particularly cod, with the season only lasting two months during February and March when daily landings can vary between 300 to 700 boxes, presents market problems. Similarly, whiting landings are typically 1,200 boxes to 3,000 boxes daily during the February/March and October/November periods and yet, during the July/August period, the same stock may only yield a total landing of say 200 boxes per day (Table 3). These peaks and troughs present the coastal merchant with tremendous problems when operating a factory.
In order to provide continuity of work for a white fish processing line, the processor has to have sufficient raw material supply to minimise overhead production costs. There are two alternative approaches. The processor can either purchase whole fish from the mainland and transport this to an Ulster factory, or alternatively take advantage of peak local landings to freeze down whole fish to supplement processing during periods of poor raw material supply. Defrosted fish would require to be utilised for added value products rather than for the fresh market, as it is unlikely that it would be acceptable to the retailer as a fresh fish fillet.
In the first case the cost of buying in from say Aberdeen, with its higher price structure over Ulster ports, together with the transport cost of say £700/lorry load, does mean that product costs are going to be substantially higher than when utilising locally caught fish. Against this must be weighed the cost of having a factory standing idle contributing nothing to overhead costs because of a lack of local supplies.
The problem with freezing down excess landings during glut periods are threefold:-

a. All whiting are landed 'in the round', i.e. not gutted. To freeze, hold and subsequently defrost ungutted whiting, would undoubtedly produce a very poor quality fillet; a product for which there will be no demand for wet fish sales, and of dubious value for value added production.

b. The problem of high energy costs in Northern Ireland, particularly with the expensive winter electricity tariff, does present a tremendous problem to the fishing industry. The winter tariff coincides with the period when the whiting stock is at its most prolific. Consequently high energy costs make the added, value process of freezing an expensive operation. Unfortunately, this cost cannot be compensated for by freezing down during the lower cost summer tariff period, as the whiting stock is almost non-existent during this part of the year.

c. Cold storage holding capacity in Ulster is limited and is mainly located in the Belfast area. These are general stores for various products. Coastal cold storage for fish is inadequate if a major move into the holding over of fish for value added
production is contemplated.

The existing daily prime processing capacity for demersal fish fluctuates widely between the larger processors situated at Ardglass, who are capable of handling 240 boxes of whiting, to the small scale processing of a mobile trader who is able to process beween 6 - 10 boxes a day.*

* Boxes are of 44kg, 98 lb or 7 stones capacity.

A broad estimation of the capacity to fillet demersal stocks, particularly whiting, is analysed as follows:

No. Persons Employed	No. Units in Ulster	Tonnes/Day per Unit	Tonnes per Annum
1 - 5	38	.35	3,125
11 - 30	3	1.28	902
31 - 100	2	9.60	4,512
			Total 8,539

The number of filleters required to accommodate the variations in landings of demersal stocks can, as is shown in Table 4, range from 80 to 180 on any given day. If some form of continuity of supply, through utilising frozen stocks of gutted whole fish can be introduced, this would enable the Industry to maximise the added value potential of the whiting stock. For example, production of a frozen breaded fillet could be contemplated. This would require processors to face up to the problem of obtaining trained skilled staff, a problem which can only be solved in the long term by introducing, on an industry basis, a correctly monitored training programme.

6. THE ORGANISATIONAL INFRASTRUCTURE

6.1 The Catching Sector

Overall governmental responsibility for Northern Ireland's fisheries rests with the Department of Agriculture (DANI). The administrative and technical work is centred on Stormont, Belfast, and biological work at the Coleraine laboratory (see Fig. 9).

The Ulster Sea Fishermens' Association (USFA) was set up in 1943. The title is, of course, self explanatory and, until the formation of the Producer Organisations, was the only organisation representing the interests of fishermen in the Province.

In line with the Aqricultural policies of the Common Market, Ulster fishermen availed themselves of the opportunity of setting up Producer Organisations. Initially the Northern Ireland Fish Producers Organisation (NIFPO), was formed from the USFA with a registered office in Bangor. This body attracted membership from all three major ports and a majority of fishermen joined, subscribing a joining fee and agreeing to a subsequent levy on earnings.

A similar organisation was subsequently formed with its registered office in Whitehaven, Cumberland, but representing the main body of herring trawlers based in Rilkeel, it is known as the North Irish Sea Fish Producers Organisation (NISFPO).

The present membership of the two POs is 101 and 57 respectively. The main attraction of membership to fishermen is, of course, the access to EEC funds, for the Minimum Withdrawal Price Scheme which is administered by DANI. Less immediately apparent, however, is the PO's role in the national and EEC political scene in lobbying in London and Brussels. The latest EEC decisions regarding 'withdrawn' catches include a so called degressive payment system whereby support payments to a boat are graduated

with reference to quantities of unsold fish landed over a period. In other words, as the total of unsold as a percentage of total landings increases, so the payment per tonne decreases. This is introduced as a deterrent to indiscriminate fishing and flooding of the market.

The other arrangement introduced is a system whereby financial support is given where catchers failing to obtain a minimum price may choose to freeze and hold fish for later sale in lieu of accepting a withdrawal price for fish. These schemes, (see Ref 5) operative from January 1983, will substantially increase the responsibilities of P4 management.

The other role undertaken by one of the Northern Ireland POs is that of operating a chandlery business. Involvement in buying and/or selling fish has been discussed from time to time but so far the P(3 boards have not made a final decision (see also Recommendations, Section 10).

6.2 The Marketing and Processing Sector Associations

The main merchandising firms in Ardglass, Kilkeel and Portavogie are all nominally members of the Fish Processors and Exporters Association. The Secretary, however, states that up until now there has been a general lack of interest in the proceedings of the organisation by members and this is, unfortunately, a familiar theme throughout the Industry. Since the preparation of this report there have been encouraging signs of a better dialogue within the Industry.

The Retailers Association

This is a branch organisation of the National Federation of Fishmongers representing the mongers whose secretary indicates the same general apathy in his organisation as appears to be the case with the Merchants Association.

6.3 Fishery Harbours

The Northern Ireland Fishery Harbour Authority (NIFHA) is responsible to DANI and is a body unique within the UK in that its function is solely to operate fishery harbours in the interests of the Industry. As such, its Board contains a representative membership from all sectors. As a statutory body, the Authority restricts its activities to the operation and maintenance of the docks' facilities and is not presently involved in the commercial side of the Industry. It was established in 1973 and it has overseen major public works at all three ports, including E4m spent at Portavogie, financed jointly by grants and loans from both the Department of Agriculture and the European Regional Development Fund. The headquarters of this organisation are in Downpatrick.

6.4 Comments on the Organisational Infrastructure

The trade organisation infrastructure of the fishing industry in Northern Ireland is largely ineffective. The only bodies which have any real influence or control over the Industry through their statutory powers are DANI, Department of Trade (DoT) and NIFHA through DANI.

The trade associations have a framework as outlined in Figure 9 which on paper would appear to allow the Industry to express itself at all levels. In practice it is found that each association lacks support from its members, very few meetings are called due to the indifference of members and consequently cooperation between the catching, processing, wholesaling and retailing sections is practically non-existent. The result is that though individual development is taking place, the fishing industry is not working together to promote a unified advancement of the Industry. There is a general lack of knowledge by each side of the Industry of the other side's problems. The distribution chain is confused and it is difficult to define any clear role between coastal merchant and wholesaler or, indeed in

some cases, retailer. These conditions make any unified marketing effort to promote fish or fish products extremely difficult.

On the catching side, the existence of two Producer Organisations, the NIFPO, whose members are mainly derived from the demersal fleet, and the NISFPO, consisting of members from a large proportion of the pelagic trawl fleet, still cannot between them attract 100% membership of catching vessels. Indeed 50% of the Portavogie fleet are still not members of either PO. Whilst a great deal of co-operation is undertaken by the two POs through the mutual goodwill of the two secretaries, neither organisation has been allowed sufficient funds to install an administration that is sufficiently staffed to cope with all demands. On the one hand, the EEC and National Government regulations create demands on staff time, and on the other hand there is the demand from members to solve day to day problems. The former include the administration of the aid fund of the intervention scheme, and the development of future policy vis-a-vis quotas, etc. In the case of the NIFPO an additional requirement is to manage a chandlery business operated by that organisation. The NISFPO operating mainly within Kilkeel, benefits financially from the traditional trade link between Kilkeel and the mainland through Whitehaven. The POs as a whole would benefit by taking a more active role in marketing their own fish. This could take the form of finding new oportunities or operating an autonomous price scheme in which the fish is withdrawn at an agreed price and then re-sold by the PO elsewhere.

In view of the limited size of the fleet and the common interest to regulate fishing effort, the existence of two POs when neither are adequately funded, is questionable. An amalgamation into one body effectively funded and managed would be more than beneficial to the future needs of the fleet in Northern Ireland (see also Section 10.4.1). However this is a question for the membership to decide.

7. FISHERY HARBOURS

7.1 Kilkeel

Extensive works were carried out at Kilkeel within the period 1971-73, whilst the harbour was still under the jurisdiction of Down County Council. The basin was enlarged and a fish market and slipway constructed. Kilkeel harbour, as distinct from the other fishing harbours, is built across the mouth of a river. There is a considerable tidal range and continuous dredging of the basin is required. An old dredger has been recently acquired by the NIFHA to carry out work previously undertaken by a contractor. There are complaints, however, that this vessel is proving inadequate.

Since 1973, the slipway has been increased in capacity to take 3 carriages and plans are in hand to increase the capability of one slip to 350 tonnes. There is a 20 tonne/day ice plant, but the needs of the harbour are very much nearer 50 tonne/day. There is an urgent need to review ice production capacity for not only vessels but for the onward distribution of fish.

The fleet has meanwhile continued to increase in size and 87 vessels were recorded as regular users in 1981-1982. The harbour becomes congested when the majority of the fleet are in port causing inconvenience when vessels are shifting berth and in servicing and repairing vessels. In addition only four boats can lie alongside the market at one time, though another four with small catches may land at the same time by double berthing. There is congestion near the entrance when boats are queuing to unload catches. The ice plant is situated near the entrance which is a poor site for the above reasons.

The provision of extra berthage and an extension of. the covered market have been considerd by NIFHA, but the massive redevelopment at Portavogie has taken all available funds and there are no immediate plans for work to start. Nevertheless, a study has been commissioned by NIFHA to examine the port's

problem. An area of land at the inner end of the harbour owned by the Authority has been suggested as the possible site of a basin extension.
A feature of Kilkeel is the considerable recent development in fishing related industry within the ports area including fish and prawns freezing, and processing and fishing gear manufacture and supply.

7.2 Portavogie

In contrast to the other two harbours, Portavogie has been developed from a beach landing site, firstly by building a breakwater, and latterly by a substantial harbour. Major works were recommended by a study presented in 1975 and at the time were estimated to cost E4m. These included the construction of a new deepwater basin, slipway facilities and a fishmarket and ice plant. These works partly financed by UK Government (DANI) funds but also supported by a 30% EDF grant, are now nearing completion. although the basin construction is still incomplete and work has yet to commence on the covered fishmarket. The fleet is still experiencing inconvenience due to congestion, however, with a regular fleet of 56 boats recorded in 1981/1982. Portavogie
of course, geographically better situated for boats working within the North Channel and for this reason is now principally a white fish port and, as such, is in desperate need of proper market facilities.
The lack of proper facilities, in particular a market hall, allows a random selling operation to take place with the sale taking place' once a number of boats have arrived and moving from boat to boat in a fairly haphazard manner. There is no logical progression along the quay and boats are still landing as boxes are being taken away after a sale. The resultant situation, with as may as 50 buyers and only one salesman and many vehicles in the vicinity, can only be described as chaotic. In addition, due to this system, buyers are unable to see the whole day's catch in advance of the sale, and therefore, have limited knowledge of

potentially available supplies. This chaotic situation has resulted in the growth of mobile traders who negotiate directly with boats. Although this provides a short term solution, in the long term it will only undermine the price structure.
The l0 tonne/day ice plant is now, however, in operation and also the slipway with covered building shed. There is severe criticism of the siting of the ice plant which is designed to feed vehicles rather than to supply directly to boats. As a result fishermen have to resort to using their own trailers to transport ice to various berths throughout the harbour. As with all ports on the Down Coast, ice production is inadequate. The situation of the ice plant is not unique though, and other ports have developed a delivery service in some cases utilising cement mixer lorries. A study currently underway by NIFHA will hopefully resolve the situation in Portavogie. Fuel oil/storage tanks are located within the harbour precincts and there is considerable room for the development of fishing related industry within a reclaimed area immediately north of the slipway which runs parallel with the north quay of the harbour.

7.3 Ardglass

In contrast to the other two harbours, Ardglass is a much older port with records going back to the 12th Century.
Despite the history there have never been more than a few local boats. Construction of a fish market did not take place until 1975 after the harbour had been taken over by NIFHA from
the Department of Commerce.
industry has been built up in the town and there are frequent landings by boats from the other ports. These boats prefer to for lying over a period, where there walls available and more sheltered of course, a major herring port for.
the Scottish drifter fleet working the Irish Sea before the development of the Kilkeel/Whitehaven herring trawl fishery.
Major works are in hand to improve the existing breakwater and
return to their home ports, are considerably more quay conditions. Ardglass was,
However, the fish processing

mooring quays and to deepen the harbour and extend the covered market. A 10 tonne/day ice plant is located within the harbour works. This too falls short of the needs of the port. The lack of shelter has undoubtedly prevented a growth of the fleet.

7.4 Other Harbours

Donaghadee at the mouth of Belfast Lough and Annalong near Kilkeel, are still used by local boats for landing catches for overlanding to Portavogie or Ardglass.

Donaghadee, which has substantial quays and a breakwater, is, however, exposed to easterly winds and is not a good place to lie during bad weather unless a mooring buoy is used. Annalong is a tidal harbour where a fleet of about 15 small herring drifters, known locally as skiffs, are based. It has also been used, as has Newcastle harbour, for laying up local trawlers. Newcastle is presently closed for repairs (summer 1983). There is a substantial commercial wharf at Dundrum where the berth, although sheltered, dries out across low water.

There are also harbours at Bangor, on the south side of Belfast Lough at Carrickfergus on the north shore and at Larne, Cushendall and Carnlough on the Antrim coast north of Belfast. All these ports are used as sheltering havens by both Northern Ireland and Scottish boats fishing the North Channel.

Boats from Rathlin Island and a few local small line boats use Ballycastle harbour which is, of course, the ferry harbour for the Rathlin community. A quay breakwater is presently being constructed at Ballycastle. The only major harbour between Ballycastle and Londonderry is Portrush which is used occasionally by trawlers to shelter or berth over the weekend. Londonderry, like Belfast, is, of course, a major deep water commercial port with riverside cargo wharves but no real history of fish landings. A restraint upon the development of fish landings in both places is the need for security measures due to the local political situation.

8. ECONOMIC STATE OF THE FLEET

For purposes of analysis, it is convenient to examine the major elements of the fleet independently. A major element of the fleet is the prawn/demersal fleet consisting of vessels in the 40ft-60ft class numbering some 123 vessels. The second major element is the more modern 60ft-80ft class comprising of 30 vessels which fishes mainly the white fish and herring stocks using pelagic trawls.

8.1 Prawn Vessel Financial Analysis

In Table 5, an example of a 47ft prawn vessel's earning capacity and operational costs are analysed for 1981 and for the period January to August 1982. The analysis is based on a typical vessel of the class and verified by comparison with a 10% sample of the remaining vessels in the class. The actual figures have been further verified by an accountant. The operating costs, excluding crews' remuneration, are approximately £78 per day to cover the direct vessel operating costs of fuel, ice, landing and berthing dues and sales commission, and a further £54 per day to cover the more fixed vessel costs of equipment hire, insurance, vessel repairs and gear costs. In addition to that total of £132 per day for vessel operating costs, the skipper/owner has to generate sufficient income to employ a crew of 3, who are paid on a share basis. This is calculated on a percentage base of gross income less direct operating costs. On average the share allocated to the crew is approximately £106 per day at sea which, over a year's fishing, equates to approximately £6,042 per man. The operating costs per day facing a skipper/owner of this type of vessel, before any remuneration for himself, any capital

interest charges or boat replacement costs are, therefore,

per day at sea.

An analysis of the boat's income during 1981 in Table 6, illustrates that this type of vessel generated 61% of its income from prawns, 10% from cod and 22% from whiting.

In 1982 there has been a visible swing to a situation where these vessels rely proporionately more on the prawn income, with this stock now supplying 72% of the vessels income. Cod (5%) and whiting (15%) still supply the major demersal support. The decline in demersal income is mainly attributable to the disturbing decline in catch rates which are highlighted in Table 7. This compares the various catch rates per hour experienced during the January-August period for 1981 and 1982 respectively. It can be seen that the catch rate on cod has declined by 55% from 6.9kg/hr to 3.lkg/hr. Over the peak cod season the decline is 60%. Similarly whiting, the mainstay of the demersal catch, has declined by 43% from 35.3kg/hr to 20.lkg/hr. Over the peak whiting season the decline is also 60%. Fortunately the prawn stock has increased its yield by 6% to 9.bkg/hr. for the 8 month period but the final outcome for 1982 indicates about a 19% increase in catch rates. The sizes landed however are predominantly of the smaller grades.

On analysis the current cost of catching, landing and selling demersal fish is estimated in Table 8 at 28p/kg or E12.58 for a 7 stone box. On the current species mix the average selling price per box is estimated at 26.lp/kg or £11.61 for a 7 stone box. Unless the prawn fleet operators make more determined efforts to improve the market value of demersal fish by carrying out shorter tows, proper icing, grading and care of the catch, then this loss situation is going to continue.

Due to the sales of demersal fish absorbing some of the vessel's operational costs, the prawn landings show an estimated profit of 61.2p per kg (Table 8). If, however, prawns were to provide the only source of income, then it is estimated that the vessel would only break even. Although prawns generate a high market return per stone landed, the volume of the catch is not sufficient to give a working profit to the vessel.

To summarise the economics, this section of the fleet relies heavily on the prawn stock for. its basic income and the demersal stocks for additional profit. However, unless some

effort is made by the prawn fishermen to provide better quality and grading of demersal fish, similar to that of the pelagic trawler, then the future for this sector of the fleet will be in doubt as regards its continuing financial viability.

8.2 Pelagic Vessel Analysis

In a similar manner to the prawn trawl vessel operator, the pelagic trawler owner is dependent upon deriving his income from various fish resources. In the absence of a substantial herring fishery, this class of vessel is very dependent upon the white fish stock to achieve viability. Income is derived from a mixture of species, the higher priced species of hake and cod, though not providing a high volume, supplement the lower priced, high volume whiting stock. In addition, the diversification during the summer period on to the limited herring fishery, provides a welcome income source during a period of very low dem ersal catches. The exploitation of both demersal and pelagic resources is vital to the economic survival of these vessels.

The direct operating costs of this vessel in 1981, with its higher fuel consumption, is approximately £238 per day at sea, Table 9. Fixed costs, repair and gear costs add a further £197 per day at sea, producing an operating cost, before any crew remuneration, of approximately £435 per day at sea. These figures are based on an analysis of 10% of vessels operating in 1982.

Due to the size and catching power of this class, the crew
is double that of a prawn trawler,
excluding the skipper. The same share basis is adopted for payment which can average at £237 per man day, which equates to approximately £6,700 per man year: an increase of 11% on the estimated earning of a prawn boat's crew member.

i.e. six crew members,

The total operational cost, including crew wages, which a skipper is faced with before any income to himself or shareholders or, indeed, allowing for repayment of capital

interest on borrowings, is estimated at E672 per day at sea. In other words pelagic trawler operating costs are three times those of a prawn trawler.

In view of the limited demersal stock available in the Irish Sea, consisting of mainly low valued whiting, the pelagic trawler operator has no alternative but to go for a high volume catch rate in order to survive economically.

8.3 Fishing Prospects

The disturbing factor of both the pelagic trawler and the prawn trawler operations is that both fleets are heavily dependent upon the whiting stock for their economic survival. The high volume catch rate of the pelagic trawler on the more mature whiting, allied to the prawn fleet by-catch of young summer whiting, produces a combination which cannot auger very well for the long term survival of this stock.

With the introduction of quotas in the Irish Sea, both classes of vessel will experience some restriction on earnings. In the case of the prawn trawler, as long as the prawn stocks can be maintained without over-exploitation, this class of vessel will be less badly affected than the larger pelagic trawlers, who depend heavily on species which will be subjected to quotas, i.e. cod, whiting, hake, etc.

The whiting quota for the whole UK in the Irish Sea is recommended to be about 9,600 tonnes. The catch of the Northern Ireland fleet alone accounted for 9,934 tonnes in 1982. The cod quotas have not yet been finally agreed, but it is likely to be about 6,400 tonnes for the UK. Based on the Northern Ireland fleet's share of 51% in 1981, this would give about 3,264 tonnes compared to the actual 3,885 tonnes in 1982. The possibility does exist of a lower cod quota to 3,200 tonnes for the UK as a whole and this would be clearly disastrous for the pelagic fleet. The potential loss of revenue for the fleet as a result of quotas is shown in Tables l0a and 10b.

9. CONSUMER SURVEY FINDINGS

To complete the study of the Northern Ireland fishing industry a detailed appraisal of the retail market potential for fish products in Northern Ireland, together with an assessment of the overall value of the market, was carried out by Ulster Marketing Surveys Ltd. under a contract from SFIA.

The survey consisted of a two stage programme of research: firstly, a quantitative consumer survey involving a representative sample of housewives throughout the regions of Northern Ireland (Fig. 10), and secondly, a trade survey, interviewing a representative sample of managers or proprietors of catering outlets.

Detailed results of the trade survey and the consumer survey are provided in a separate report, the principle findings are summarised.

9.1 Consumer Survey

9.1.1

Of the four main forms of fish available to consumers, the most likely to have been purchased by the housewife was fresh fish, 4 houswives in 10 stating that they had made such a purchase. In comparison, 3 in 10 had purchased frozen, with just over 1 in 10 having purchased canned and smoked fish respectively. As com paritive yardsticks, 8 housewives in 10 had purchased beef, 4 in 10 pork and 2 in 10 lamb (Fig. 11).

9.1.2

Fresh fish was rather more likely to have been purchased by housewives aged over 35 than those below this age, whereas the reverse was true for frozen fish. No clear pattern in relation to age emerged for the purchasing of canned fish, but smoked fish appeared to be distinctly more popular with older housewives,

(15 - 24) being particularly Amongst households with

with those in the youngest age group unlikely to have purchased any.

children, frozen fish was the most likely form of fish to have been purchased, while fresh fish was most likely to have been purchased by those households without children (Table 11).

9.1.3

The purchasing behaviour of housewives with regard to fish was obtained more definitely by asking how often they tended to purchase fresh, frozen and smoked varieties. The most frequently purchased was fresh, with 57% of housewives overall claiming to buy the product at least once a month. In comparison, 49% purchased frozen. fish monthly and 33% smoked (Fig. 12).

9.1.4

On the last purchasing occasion, the average expenditure was highest for fresh fish, at £1.35, compared to £1.28 for smoked and £1.25 for frozen (Fig. 13).

9.1.5

Estimates of the value of the consumer market for fish were obtained by appropriate weighting procedures, based on enumerated households obtained from the 1981 census, and allowing for frequency of purchase:

FRESH £12.3 Million
Cod £ 6.3 million
Whiting £ 2.9 million
Haddock £ 1.3 million
Herring £ 0.2 million
Mackerel £ 0.1 million
Others £ 1.5 million
FROZEN £ 8.4 Million
SMOKED
5.5 Million
NOTE: Based on Retail Prices

9.1.6
The most likely source of the last purchase of fresh fish (Fig. 14) was the local fishmonger, 47% having made their last purchase at such an outlet, and these were followed by supermarkets (17%), open markets (15%) and door-to-door (13%). Usage of fishmongers tended to decline from Belfast across to the West of the Province and it was of particular interest to note that purchasing through open markets or through door-to-door distribution was most prevalent in the South (mainly Co. Down), presumably a result of the fact that the main fishing ports are located in this region.
9.1.7
There are indications of a high degree of stability in this market (Fig. 15) with just under 6 housewives in 10 stating that as far as they were concerned, there had been no change over recent years in their fish purchasing habits. Against this however, those stating that they now purchased more fish (17%), were slightly outweighed by those purchasing less (24%). Older housewives, and those from unskilled working-class households were marginally less likely to have increased their buying of this product than were younger housewives, or those from more middle-class households.
9.1.3
Amongst those whose purchasing had increased, the reason most frequently put forward related to dietary considerations, fish being regarded as a 'healthy' food, with 37% expressing a view along these lines. Children having acquired the taste was referred to by 33%, and that fish represented good value was mentioned by 25%. (Fig. 16).
9.1.9
Amongst those claiming to buy less fish nowadays, taste and product characteristics were appreciably more likely to be expressed as reasons (especially as far as the family were concerned rather than themselves), than was expense. Changed family circumstances were also mentioned in a number of cases,

and a small number also referred to perceived difficulties and inconvenience in cooking fish (Fig. 16).

9.2 Catering Survey

9.2.1

Preliminary desk research provided the following estimates for the total numbers of catering outlets in Northern Ireland:

Hotels	142
Licensed Restaurants	192
Unlicensed Restaurants	163
Cafes	292
TOTAL RESTAURANTS	789
Carry-Outs (Fish & Chips)	400

These estimates were provided mainly by the Northern Ireland Tourist Board, who derive records as part of their outlet inspection 'Seal of Approval' role, and Area Health Boards, who administrate the maintenance of hygiene standards.

9.2.2

Of a range of five primary food categories, fish was most likely to be served on a regular basis, with 95% of outlets including it on their menu, followed closely by poultry at 92% (Fig. 17).

9.2.3

Of eleven fish types, whiting was the most likely to be served, with 62% overall offering it, this was followed by plaice and cod with 42% of outlets (Fig. 18). Whiting was markedly more popular amongst carry-outs, virtually all of which served it, and cod similarly was more likely to be offered by these establishments as opposed to restaurants. As far as restaurants were concerned, plaice and prawns were the most likely types of fish to appear on menus.

9.2.4
All establishments were asked to state their normal weekly expenditure for each type of food served on a regular basis. In addition, those serving fish were asked for similar information in respect of each type of fish normally served. These average weekly expenditures were subsequently weighed up to the total numbers of these outlets in Northern Ireland, and then annualised by multiplying by 50 weeks. The catering market for fish in Northern Ireland is estimated (at wholesale prices) at £6.1 million, placing it in second place. In comparison, the equivalent market for four other food types were:

Beef £7.2 million
Poultry £4.9 million
Pork £1.6 million
Lamb £1.1 million

The division of the catering market between the two outlets of restaurants and carry-outs is analysed as follows (Figs. 19/20).

	Restaurant	Carry-out	Total
Beef	£(Million) 6.4	£(Million) .8	£(Million) 7.2
Fish	3.4	2.7	6.1
Poultry	3.4	1.5	4.9
Pork	1.4	.2	1.6
Lamb	1.1		1.1

9.2.5
The catering market for fish in the restaurants (Fig. 21) illustrates the consumer preference for prawns (scampi) (35%) and plaice (24%). These two species provide 59% of all fish dishes served.
Whiting (15%) and sole (9%) provide the main alternatives for consumer preference.

The 'carry-out' trade, mainly fish and chip shops, shows a completely different consumer preference with whiting (70%) dominating sales (Fig. 22).
Cod (15%) and haddock (4%) are the other main alternatives with plaice commanding less than 2% of the fish market share in carry-outs.

Estimated Northern Ireland Catering Market
for 'Prepared' Fish (Wholesale Prices)

TOTAL:	£6.1 m
BY TYPE:	
Whiting	£2.4 m
Prawns	£1.2 m
Plaice	£0.85m
Cod	£0.6 m
Sole	£0.3 m
Clams/Shellfish	£0.2 m
Haddock	£0.15m
Lobster	£0.1 m
Mackerel	E0.05m
Herring	£0.04m
Others	£0.2 m

9.2.6
70% of those outlets serving fish stated that they obtained their supplies from a fish wholesaler. Just over 20% were supplied by a local fishmonger, followed by direct quayside purchasing, 10%. Regional variations occurred in these respects, with fishmongers being substantially more important to outlets within the Belfast vicinity, while wholesalers and direct purchasing were more popular in other areas (Fig. 23).
9.2.7
Assessment of customer throughflow revealed that, on average, carry-outs served just over 1,500 customers per week, and restaurants 875. Overall, 38% of the customers of these

outlets would order fish, and this proportion was higher at carry-outs (47%) and lower at restaurants (22%).

9.2.8

While just under half of the catering proprietors or managers thought that there had been little change in the popularity of fish over recent years, over twice as many took the view that fish had increased in popularity than took the view that it had decreased. Restauranteurs in particular were inclined to the view that fish was more popular (Fig. 24).

9.2.9

Dietary reasons, with fish considered to be a healthy food, was the most frequent reason expressed for the increased popularity of fish, although effectively equivalent proportions also took the view that fish represented good value and was inexpensive. Other important reasons were the increasing variety of fish, mentioned by 17%, with a further 9% stating that availability of fresh fish was better nowadays (Fig. 25).

The increasing availability of other fast foods such as hamburgers and hot dogs, and the popularity of these with young people, was the most frequently expressed reason for the decreasing popularity of fish. A smaller proportion of outlets also pointed out that fish, especially as a carry-out, was less convenient to eat (See also Table 11).

10. DISCUSSION AND RECOMMENDATIONS

10.1 The Catching Sector

10.1.1 Fishing Within the Quota

The likely EEC quotas for Irish Sea catches for U.K. vessels highlight the problem facing the Northern Ireland fleet as far as white fish are concerned.

The UK quota of whiting for 1983 was to be 9,600 tonnes, this is in fact equivalent to the catch of the Northern Ireland fleet alone for 1982. This quota is likely to be enforced in 1984. Whiting is, of course, by far the greatest white fish catch by the County Down fleet. Recent indications are that the cpue on cod has decreased to the extent that the EEC quota of 6,400 tonnes is unlikely to present problems of overfishing by the local fleet. However the overall UK catch will probably exceed the EEC TAC and this could be reflected in the future share of the quota for Northern Ireland and if a lower quota than 6,400 tonnes is adopted this could be disastrous for the pelagic fleet.

There is no easy solution to the cod and whiting problem. However various drastic alternatives -are possible. These involve either a reduction in effort per boat, clearly not attractive from an economic point of view, or an overall reduction in total effort.

More attractive is the possibility for an increased shift of effort by some of the more powerful units of the fleet to fish for white fish off the NW Coast and if satisfactory outlets can be established, to fish mackerel and herring around the North and West coasts. The latter possibility is the subject of a separate study currently being completed. This is of course of particular interest to the purse seiners whose opportunities elsewhere are being steadily diminished.

The larger trawlers- have undoubtedly established increased interest in locally caught whiting by virtue of landing a better product.
Nevertheless the prawn trawlers are equally reliant upon these stocks to provide the profit over and above the 'bread and butter' prawn operation and these vessels are more limited in their options because of their smaller size and power.
It is, therefore, recommended that every effort should be made to encourage the pelagic trawlers to extend their operations for white fish into ICES area VIa i.e., north and north west of Ireland to the Southern Hebrides.
it is recognised that Government assistance will be required in order to allow Skippers to gain knowledge of this fishery whilst remaining financially solvent. Commercial trips will have to be subsidised over a sufficiently long period, probably several months, to account for short term variations in the availability of fish which can so easily mask the real potential of a fishery if a trial is carried out over a period of a few weeks only.
Secondly, every effort should be made to exploit the stocks of herring and mackerel by these larger trawlers within ICES areas VIa and, VIIb. West of Scotland and Ireland. Currently these stocks are fished mainly by purse seiners for the unpredictable African market through transhipment on to klondykers. A preliminary feasibility study has been commissioned by SFIA to examine the economic viability of developing a processing complex within Northern Ireland which could provide freezing and cold storage facilities for white fish catches held over and more significantly by the introduction of the production of either canned or frozen, value added products from pelagic stocks. These could exploit other more lucrative World markets, particularly within Western Europe.

Ideally these shifts of effort by the larger trawlers would more or less bring effort on North Irish Sea stocks back within quota limits. However, it may well be necessary to consider limiting the by-catch of the prawn boats. One way of achieving this would require the use of a separator trawl as designed for shrimp fisheries. The mesh size within the fish bag section would have to be sufficiently large to allow the escape of small whiting but to retain larger sizes. Some development work would undoubtedly have to be carried out. It is suggested that the Marine Laboratory of the Department of Agriculture and Fisheries for Scotland (DAFS) and the Flume Tank staff of *the SFIA should consider a joint project to investigate reducing fish by-catch by this method. DAFS have been working on trawls designed to separate species into different codends for some time.

10.1.2 Fish Handling

Fish handling particularly on the prawn boats must be improved. An educational programme run by the training services section of SFIA with both onshore and at sea instruction is regarded as of high priority. Both the aspects of grading and proper gutting and icing of the catch should be tackled. The Northern Ireland agricultural industry have already been able to set very high standards to increase their market opportunities and the same attitude must be engendered in the fish industry.

The question of the use of suitable must be addressed. It is inconsistent boxes are used for onward transport where out, whereas shallow boxes suitable for are utilised on board resulting in large inadequately iced.

boxes for cod and hake that deep, stack nest proper icing is carried small fish or nephrops fish being crushed and therefore, pool.

The problem is that few boats own their boxes and,

most are dependent upon obtaining boxes from a central

A re-arrangement of responsibilities for fish sales and hence market boxes would provide an opportunity for the introduction of improved boxes. Clearly considerable sums of money would be involved. Nevertheless, this would seem to be a worthwhile case for grant aid to the industry. Another aspect of the box situation is that owing to the system whereby boxes are tipped on the market and placed directly back onto boats, little or at least inadequate cleaning is commonplace. Ideally a new approach to boxing should allow for adequate daily pressurised cleaning of boxes whilst a duplicate outfit of boxes are placed on board.

It is understood that box leasing arrangements, as opposed to outright purchase, can be made with at least one large manufacturer of plastic boxes.

10.2 The Markets

10.2.1 The Market Hall

Particular problems occur at Portavogie owing to the present lack of a proper covered market hall and the resultant random method of selling fish. Most of these problems will undoubtedly disappear when fish can be laid out in a relatively secure market hall. The completion of this facility must be given top priority. All fish must pass openly through this market whether or not it is sold by contract or for auction. The market should be securely closed outside of sale periods and the landing of fish without special permission outwith the market building should be prohibited. These latter remarks should of course apply to all three port market halls.

10.2.2 The Role of NIFHA

It is further recommended that the statutory powers of NIFHA
be extended by DANI to control the selling of fish within their markets. This move would enable NIFHA not only to provide a truly independent sales service but would also enable that body to enforce better general discipline on the market and, of course, security.

NIFHA could, of course, also take responsibility for the supply of boxes and for box cleaning operations. Alternatively Producer Organisations could handle these operations on behalf of their members.
Additional revenue accruing to the NIFHA would strengthen that body's finances and allow further reinvestment into the industry.
Equally it is felt that boat owners would benefit by lower costs than are presently paid as a commission on fish sales. Buying at first hand sales should be restricted to fish trading organisations, direct sales to the public should not be allowed. Such sales could of course be carried out on a second sale basis. See also 10.3.1.

10.2.3 Market Times

The possibility of morning markets should be studied. There are attractions in,allowing additional time for the packing and transport of fish to the following day's mainland or indeed Ulster market and it would be to the best advantage of the auction system if a standard time for sales were agreed by all three ports. The proposal to set up a proper box collection, cleaning and supply system would benefit by the extra time available between the landings and distant market sales.

10.2.4 Review of the Rule Governing the Withdrawal of Fish

The application of the regulation stipulating that; all fish of a particular species remaining on the market after that point in the auction sequence when fish of that species are unsold, should be reviewed to remove any doubts and anomalies. The variation in quality standards at the time of landing in Northern Ireland means that a buyer may be unable to buy quality fish if in fact the sale stops prior to the fish he is looking for being offered for sale. The Council Resolution covering the sale of fish and compensation for the Withdrawal Scheme is resulting in the practice that quality fish could be withdrawn

simply because poorer grade fish, but not necessarilly unsaleable fish, from an earlier landing could not be sold.

10.3 Processing and Retailing

10.3.1 Mobile Van Salesmen (Portavogie)

. Individual mobiles or small van salesmen should be encouraged to form a trading organisation on similar lines to that existing at Grimsby, setting common standards of service and quality. These small traders should be offered premises or areas within a properly built facility which should be constructed on reclaimed land North of Portavogie harbour. The present situation where fish and particularly nephrops are processed in private dwellings or even outhouses does not meet the food hygiene regulations set out in the Food and Drug Act. Subsequent to the provision of a proper small trader processing hall, the public Health Authority should be urged to prohibit any possible unlicensed operation.

Mobile van salesmen undoubtedly provide an invaluable service in extending sales throughout the countryside in particular but they should be subject to exactly the same health and licensing regulations as in other parts of the UK.

10.3.2 Coastal Merchants

Coastal merchants should be encouraged to develop the production of value added products, for example whiting blocks or breaded whiting products, or combination recipe products for the supermarket trade.

This will require the institution of training programmes for staff which could be provided by the SFIA as long as Government Finance can be made available.

These merchants should address themselves to the problem of providing graduated bonus payments to filleters to allow properly graded whiting to be sold on the market.

The provision of adequate freezing and cold storage facilities at the fishing ports, provided by processing firms, is an allied requirement as fish should be purchased and held over at times of glut for further processing into value added products to maximise processing efficiency during slack periods of raw material supply.

10.4 Organisational Infrastructure

10.4.1 The Producer Organisations

Perhaps the most important and widely acknowledged requirement is for a strengthening of the organisations within the industry. On the catching side, the two existing Producer Organisations would benefit by merging as a single body to enable it to represent the industry at all levels from quayside to national Government and the European Community. The control of landings, can only be effective if staff are available on a daily basis at market times and there is adequate information available to them. Equally, management of the withdrawal compensation schemes must be carried out taking account of the national supply position. An adequately financed PO, can offer incentives to members for example, by providing supplementary withdrawal payments for properly graded quality fish. Within the EEC regulations, the PO should take a more active part in finding new market opportunities for fish caught by its members. It is acknowledged that the present situation of low membership particularly at Portavogie is not in the long term interests of anyone, although to non-members it may appear to be in their short term interest.

10.4.2 Fishermens_' Co-operatives

It is proposed that fishermens' co-operatives at port level should be established to expand the catchers interests into the marketing of their products. It is undoubtedly true that cooperative involvement, supported by the PO or as an ancillary

activity to the PO, would greatly enhance the short term attractiveness of membership. Accordingly it is recommended that the P.O. should take up an active role in promoting cooperatives. An alternative buying force would thus be present on the markets with the mutual interest of the fishermen in the forefront. The success of the co-operative at Greencastle,, Co. Donegal, which overlands its fish directly on to the Grimsby market is a good example though a Co. Down co-operative should also enjoy a large local market. The existing chandlery business of the NIFPO should be transferred to cooperative management and the resultant integration through catching, selling and chandlery including the supply of oil and fish boxes should benefit the fishermen without detriment to other sections of the industry.

10.4.3 The Processors

The Northern Ireland Fish Processors and Exporters Association should be revitalised and should include membership by an association of fish processors at Portavogie including the proposed mobile traders association. The involvement of the Northern Ireland Fishery Harbour Authority in the selling of fish is discussed under Section, 10.2.

10.5 Port Facilities

The main immediate requirement is of course the completion of the work on the basins and on the market at Portavogie. The latter cannot be overstressed.

Extension of the market at Kilkeel is desirable especially to reduce the current level of congestion caused on the market owing to the practice of transferring of fish into transport containers from fish boxes. Space will also be required for the provision of the recommended box washing facilities. Additional quayside berthage is of course desirable to ease the problems of storing and repairing vessels within a congested harbour, but if there is a reduced level of activity at Kilkeel following a shift of effort to Area VIa such an extension may be reviewed later.

The possibility of an increased usage of Portrush by vessels fishing the North Coast must be considered. The requirements in terms of facilities and access should be studied by the local harbour authority in consultation with NIFHA.

The latter recommendation must be considered in the light of the findings of the SFIA study into processing facilities on the North Coast of Ulster.

10.6 Ulster Market Outlets

The consumer and catering research surveys have indicated the strength and stability of the Ulster market. These two factors if correctly developed by improved service and marketing techniques could provide the industry with a sounder base on which to build its future business strategy rather than its present reliance upon markets in Great Britain.

TABLE 115

WEIGHT AND VALUE NORTHERN IRELAND LANDINGS 1980, 1981 AND 1982.

SPECIES	1980 TONNES	1980 £	1981 TONNES	1981 £	1982 TONNES	1982 £('000)
PELAGI	2,450.26	607,561	1,816.14	306,054		
Herring	59.04	4,647	55.24	4,712	2,263	399.4
Mackerel	0.61	36	-	-	9,580	954.7
TOTAL PELAGIC	--					
	2,509.91	612,244	1,871.38	310,766	11,843	1,354.1
DEMERSAL:						
Brill	11.67	9.889	6.32	5.968	7	7.3
Cod	2.593.50	908.416	3.368.74	1.034.011	3.885	1.501.0
Conger Eel	0.05	5.15	38	5.237	15	4.2
Dabs	0.71	99	0.69	54	1	.3
Dogfish	287.48	30.	271.682.50	73.613	1.100	160.9
Flounders	0.13	11				
Gurnard	1.24	41				
Haddock	51.82	12.445	58.30	16.461	30	11.5
Hake '	68.13	38.097	567.56	518.672	385	386.1
Ling	27.00	6.897	44.26	8.706	33	6.9
Megrims	4.52	730	6.24	1.516	5	1.2
Monk/Angler	227.11	61.324	288.62	101.179	409	129.3
Plaice	140.25	43.146	136.28	48.128	161	54.4
Pout '	0.56	29				
Ray or Skate	124.45	30.364	112.00	26.893	10o6	25.7
Roe	61.20	10.381	76.61	12.297	80	16.2
Saithe or Coalfish	310.45	62.975	587.05	105.434	879	148.7
Soles	43.90	50.178	40.96	64.771	34	56.5
Turbot	3.85	2.650	0.37	525	2	4.0
Whiting	3.953.55	724.384	9.050.091.383.923		9.934	1.885.9
Witches	1.65	358	3.28	814	5	1.3
Other Demersal Fish	168.88	37,767	194.56	"	199	59.0
TOTAL DEPIERSAL	-			3,451,290	17,271	4;460:4
	8.092.10	3.030.457	15.220.81			
TOTAL FISH	10,592.01	2,642,701	17,111.19	3,762,056	29,114	5,814.5
SHELLFISH:						
Crabs	5.77	1.470	3.90	885	2	0.9
Escallops	41.22	13.714	32.87	60.757	15	35.8
Lobsters	16.25	52.693	19.75	74.813	15	70.4
Nephrops '	2.543.95	1.831.067	3.752.28	2.480.649	` 4.488	3.491.0
Periwinkles	392.51	55.198	102.18	23.350	276	58.4
Queen Escallops	21.42	7.822	0.07	12		
Squids	23.42	17.387	111.82	107.879	165	154.6
Crayfish'	-	-	0.01	3	-	-
TOTAL SHELLFISH	3,044.54	1,979,351	4,022.88	2,748.348	4,961	3,811.1 ---

TOTAL WEIGHT ARID					
VALUE OF ALL FISH	13,636.55	4,622,052	21,134.07	6,510,404	34,074
9,625.5					

TABLE 117

JAN = SEPT. - FISH LANDED IN NORTHERN IRELAND'S PRINCIPAL VISHING PORTS E'000)

KII.KEEL		ARDGLAS.4		PORTAVOGIE		TOTAL -			
1981	1982	1981	1982	1981	.1982	1901	..1902		
NO. OF LANNINGS		4423	6246	1986	1645	i366	6104	11775	13995
TONNES E	TONNES E	TONNES £	TONNES E	TONNES £	TONNES E	TONNES £	TONNES E	TOMES E	
Cod									
		1687 586.9	2134 970.0	323 135.2	243 02.6	526 168.5	674 280.0	2536 890.6	3051 1360.6
Dogfish		30 3.0	99 14.0	61 6.0	139 16.1	309 30.3	376 41.2	.406 47.3.	'614- 71..3.
haddock		11 3.0.	7 4.0	11 4.3	3 1.4	21 6.0	9 3.5	43 14.1	19 - 8.9
hake		32 17.6	44 39.0	43 29.0	27 24.9	321 312.1.	179 188.4	396 358.7	250 252.3
Monk		68 22.0	30.9	147 47.9	204 75.0	314	`98.2		
Plaice		55 16.2	76 28.0	110					
Saithe		78 17.3	171 43.0	60 17.3	48 10.2	169 22.3	366 62.1	307 56.9	505. 115.)
Skate.		"							
Soles		4 7 8 6	12 0 5 7	1 3 5 5	23 36 8	17 30 3	32 51 7	26 47 0	
WhILIng		1540 242.7	3.186 597.0	1165 214.1	1051 207.0	2541. 433.2	3072 673.3	- 5246 890.0	7309. 1477.3
Other		121 28.0	133 35.0	52 -	15.9	11 -	227 47.8	97 77.4	3.50 91.7	241 102.4
TOTAL		3636 940.7	5906 1707.0	1793 450.6	1593 391.9	4267 1131.1	5020 1423.0-	9698 2530.4	12599 3601.9
herring		361 64.3	276 47.0	469 84.4	463. 82.7	577 t774	710.3		
Nephrops		442 860.4	791 1863.0	246 436.7.	157 347.0	374 750.9	348 794.0.	1062 2049.0	1296 3004.0
Olaier		3 4	44 50.0	16 -					
TOTAL		4444 1073.4	7057 3697.0	2552 1021.7 -					
LANDED		221 3 821 6	5234 1907 6	6424 2405 6	t2230 4082 7	15694 6924 2			

(SOl1NCE: D.A. N.1.)

TABLE 118

ANALYSIS OF LANDINGS
1) WHITING LANDINGS 1982 1981 AND 1982
1.1 PELAGIC TRAWLER:

Variation in No. Boxes Landed/Day 18 - 41

1.2 PRAWN VESSEL:

Variation in No. Boxes Landed/Day 6 - 11

Ave. 24
Ave.
1.3 DAILY LANDING - WHITING
KILKEEL ARDGLASS PORTAVOGIE

Type/ Boat	No. Vessels	Boxes Range	No. Vessels	Boxes Range	No. Vessels	Boxes Range
Pelagic	(20)	360-820			(10)	180-410
Prawn	(67)	402-737	(13)	78-143	(46)	276-506
		761 1557		78 143		456 916

DAILY TOTAL MARKET SUPPLY 1296 - 2616 BOXES
DAILY TOTAL MARKET DEMAND 1500 BOXES
EXCESS LIKELY - FEBRUARY-MARCH AND OCTOBER-NOVEMBER
2) COD LANDINGS FEBRUARY/APRIL ONLY
KILKEEL ARDGLASS PORTAVOGIE No. Boxes No. Boxes No. Boxes Fleet Range Fleet Range Fleet Range
---
Pelagic Prawn

(20)	100-220			(10)	50-110
(67)	67-201	(13)	13-39	(46)	46-138
	167 421		13 39		96 248

DAILY VARIATION IN MARKET SUPPLY 276 - 708 BOXES

TABLE 119

PROJECTION, OF PRIME PROCESSING REQUIREMENT IN NORTHERN IRELAND

1. Estimated Annual Fresh Whiting Market (Whole Fish Equivalent) Tonnes in Northern Ireland 9000

2. A filleter's productivity on average - Whiting = 15 Boxes/Day =1.875 Boxes/Hr. 3. Box capacity (44.46 kg) whole fish - a filleter processes =83.36 Kg/Wf/Br. 4. Total No. Man-Hours required to process annual whiting consumption 107,965 Man/Hrs. 5. No. Prime Processing staff required for daily variations in landings

Pelagic Fleet Landings	Low	High	Prawn Fleet Low	High

---

27 737 49

18 506 34

5 143 10

No. Boxes	No. Filleters	No. Boxes	No. Filleters	No. Boxes	No. Filleters	No. Boxes	No Fillleters
Kilkeel 360	24	820	55	402			
Portavogie 180	12	410	27	276			
Ardglass				78			
540	36	1230	82	478			

SUMMARY

50 880 93

	LOW	HIGH
Filleters	86	175
No. Service Staff for Filleters	28	58

TABLE _5

FINANCIAL ANALYSIS - TYPICAL PRAWN TRAWLER 1981-1982

Reg. Length - 47.1 Ft.

Horse Power - 150 H.P.

No. Crew - Skipper + 3 Crew ----------

1981 8 Months- Cost Per Day At Aug.-1982 Sea ----------

No. Days at Sea	171	25	1981	1982
Weight Landed	Tonnes	Tonnes		
Demersal Fish	109.99	45.67		
Nephrops	17.26	14.60		

Grossing			127.25	60.27
Subsidy			----------	
			£56703	£43792 £331.60 £350.34
			£ 400	- 2.33 -

			£57103	£43792 £333.93 £350.34
Expenses Direct Costs:				
Food			1791	1377 10.48 11.02
Fuel			6236	5227 36.47 41.81
Ice			36	30 .21 .24
Landing Dues			1155	889 6.75 7.11
Sales Commission			3332	2180 19.48 17.44

			12550	9703 73.39 77.62
Fixed Costs			----------	
Hire of Equipment			1606	1333 9.39 10.66
Insurance			1555	1326 9.10 10.61
NHI Stamp			862	759 5.04 6.07
Managerial Expenses			522	483 3.05 3.87

			4545	3901 26.58 31.21
TOTAL OPERATING EXPENSES			----------	
			17095	13604 99 97 108 83
OPERATING SURPLUS			40008	30188 233.96 241.51
Share - T11ocatl.on:				
Crew			16755	13221 97.98 105.77
Skipper			7263	5953 42.47 47.62

			24018	19174 140.45 153.39

Boat Expenses:				
Repairs			2292	1750 13.40 14.00
Gear			1530	1125 8.95 9.00

			3822	2875 22.35 23.00
Net Operating Profit			----------	
(Before Interest _&				
Depreciation reciatio-"			12168	8139 71.16 65.12

TABLE 122.1

ANALYSIS _OF PRAWN TRAWLER GROSSINGS _A-ND--EANUTNGS --JANUARY -- AUGUST 1T981 i) VESSEL GROSS INCOME

Month	Jan	Feb	Mch	April	May	June	July	Aug	Jan-Aug	Division	
No. Days Fishing,		21	11	19	13	17	16	7	13	117	of Income
g	£	£	g	g	£	g	E	£"	%		
Cod -		763		1109	1467	445	253	65	24	49	4175	10 0
Dogfish		13		19	4	4	9	9		24	82	2
Haddock		72		49	50		23				194	5
Hake		226		37	164	230	200	33	85	66	1041	2 5
Monks		66		57	138	70	124	57	24	46	582	1 4
Plaice		1 23			25	9	17		3	28	205	5
Saithe		106		134	169	43	4	4			460	1 1
Skate		21		4	3	3					31	.1
Whiting		1729		3207	2639	682	506	68	52	345	9228	22 0
Sole					54				16		70	2
Mixed		45 75 111 61 15 55 6 26 394 .9										
		3164 4691 4824 1547 1151' 291 210 584 16462 39 2										
Prawn												
Squid		5									5	
		5422		5035	7056	4512	5900	5192	3825	4926	41868	100.0

TONNES

ii) VESSEL LANDINGS - 1981

	Jan	Feb	Mch	April	May	June	July	Aug	Total	Division	
T	T	T	T	T	T	T	T	T	T	of Catch	%
Cod		1 50		2 79	4 25	1 10	47	16	06	11	10 44	12 1
Dogfish		09		09	01	05	13	08		45	90	1 0

Haddock	24	22	10		03				59	7
Hake	55	07'	16	36	25	04	08	07	1 58	1 8
Monk	.21	.25	.51	.21	.34	.16	.07	.26	2.01	2.3
Plaice	45		05	02	03		01	15	71	8
Saithe	.30	.39	.73	.06	.01	.02			1.51	1.8
Skate	08	01	01	03					13	2
Whiting	8.03	21.86	16.84	2.73	1.98	.21	.23	1.76	53.64	62.2
Sole			05				01		06	1
Mixed	.20	.20	.54	.32	.03	.20	.03	.15	1.67	1.9
		25.88	23.25	4.88	3.27 --------	.87	.49	2.95	73.24	85.0
Prawn	1.26	.16	1.07	1.52	2.46	2.56	1.80	2.09	12.92	15.0
Squid	.02								.02	

---------- ----------12.93 26.04 24.32 6.40 5.73 3.43 2.29 5.04 86.18 100.0 ----------
---

TABLE 6.2
ANALYSIS OF PRAWN TRAWLER GROSSINGS AND LANDINGS JANUARY-AUGUST 1982

iii) VESSEL GROSS INCOME

Month	Jan	Feb	Mrch	April	May	June	July	Aug	Jan-Aug	Division
No. Days Fishing	16	17	19	15	13	15	13	17	125	of Income
			444	776	624	70	100		-	2236 5.2
Dogfish 43			32	37		57	4	38	2	213 5
Haddock			3		47					50 1
Hake 14			54	34	133	143	183	99	11	671 1.6
Monk 215			197	279	206	59	74	53	51	1 134 2 6
Plaice 109			92	70	10	12	29	4	1	327 8
Saithe			36	40	79	3		8	3	169 .4
Skate 60			26	33	34		1			154 4
Whiting 889			1428	1907	1223	475	282	181	208	6593 15.3
Sole 11			7	17	27			9		71 2
Mixed 39			53	82	12	13	53	26	42	320 .7
			1597	2372	3275	2395	832	726-	423	318 11938 27.7
Prawn			2447	2481	3398	3439	3650	6548	4775	4345 31083 72.2
Squid			25		25					.1
			4069	4853	6673	5834	4482	7274	5198	4663 43046 100.0

TONNES

iv) VESSEL LANDINGS

Jan	Feb	Mch	April	May	June	July	Aug	Total Division
T	T	T	T	T	T	T	T	T of Catch 8
Cod	.39	.99	1.79		1.46	.15		.02 4.95 8.2
Dogfish	.29	.14	.07		.18		.11	.57 .01 1.37 2.3
Haddock		.01			.04			.05 1
Hake	.03	-	.04	.03	.13	.18	.18	.08 .01 .68 1.1
Monk	.58	.45	.60		.4.4	.24	.22	.20 .23 2.96 4.9
Plaice	.30	.16	.09		.02	.02	.05	.01 .01 .66 1.1
Saithe	.03	.12	.16		.41	.01	.03	.01 .01 .78 1.3
Skate	.16	.05	.11		.09			.41 .7
Whiting	4.73	6.19	11.09		6.76	1.37	.91	.73 .89 32.67 54.2
Sole	.01	.01	.02		.02			.01 .07 1
Mixed	.10	.16	.25		.10	.03	.19	.09 .15 1.07 1.8
	__-6.62	-----8.32_		------4:21	------9.47	--------2.18	___--.84	-------.72 -----1.31 - 75.8
Prawn	1.17	1.29	1.54		1.41'	1.73	2.92	2.22 2.29 14.57 24.2
Squid	.03							.03

7.82 9.61 15.75 10.38 3.91 4.76 3.94 3.60 60.27 100.0 ----------

TABLE 126
CATCH RATES 1981, 1982 - PRAWN TRAWLER (DAILY AVERAGE - 13 HRS/DAY AT SEA) 8 ,MONTHS TO AUGUST

NO HOURS FISHING	1981 1521	1982 1625	VARIANCE % +
Cod	6.86 kg/hr.	3.05 kg/hr*	(55.5)
Dogfish	.59	.84	42.4
Haddock	.39	.03	(92.3)
Hake	1.03	.42	(59.2)
Monk	1.32	1.82	37.9
Plaice	.47	.41	(12.8)
Saithe	.99	.48	(51.5)
Skate	.09	.25	177.8
Whiting	35.27	20.10 **	(43.0)
Sole	.04	.04 '°	-
Mixed	1.10	.66	(40.0)
Prawn	8.49 11	8.97 ***	5.7
Squid	.01	.02 51	100.0

NOTES * and
When the 1981 and 1982 data relating to the main two months of the demersal season is examined, thedramaticdrop in catch rates isevenmore apparent for this class of vessel, i.e. 60% in each case.
NOTE *** Over the 8 months the data for the prawn catch shows only a small increase in catch rates from 1981 to 1982. For 1982 as a whole, the evidence is a significant increase of about 19%

TABLE 127
PRAWN TRAWLER COST OF CATCHING, LANDING AND SELLING AT QUAYSIDE
DEMERSAL AND SHELLFISH

1981	Jan-Aug 1982	Cost Est. ----- ---------- Shellfish Demersal Shell Demersal Shell Catch Only Fish Fish 1982

TONNES LANDED		109.99 17.26 .45.67 14.60 14.6

		P/Kg P/Kg P/Kg P/Kg P/Kg
QUAYSIDE SELLING		
PRICE		22.0 193.2 26.1 213.0 213.0
OPERATING COSTS:		----------
CATCHING		12.9 12.9 22.2 22.2 91.8
LANDING		.4 3.9 .5 4.3 4.3
SHARE MONEY		6.9 101.7 4.3 114.6 80.0
SELLING		1.1 9.7 1.3 10.7 10.7

		21.3 128.2 28.3 151.8 186.8

PROFIT - BEFORE DEP'N & INT		.7 65.0 (2.2) 61.2 26.2

TABLE 128
FINANCIAL ANALYSIS PELAGIC TRAWLER
Reg. Length - 74.5' Horse Power - 500 H.P.
No. Crew - Skipper + 6 Crew

1981	1982
No. Days at Sea	170 170
	£ £ 2 £
	Cost/Day At Sea Cost/Day At Sea
Grossing	122,000 718 141,000 829
	122,000 718 141,000 829
	Annual Cost Annual Cost
EXPENSES	
DIRECT COSTS:	
Food	2,225 13 2,341 14
Fuel	24,030 141 27,538 162
Ice	
Sundries	67 - 100 1
Sales Commission	6,422 38 7,332 43
Landing/Wharfage	2,702 16 3,102 18
	35,446 208 40,413 238
FIXED COSTS:	
Equipment Hire	2,360 14 2,903 17
Insurance	7,579 45 8,792 52
Admin Cost Etc.	2,037 12 2,100 12
TOTAL FIXED COSTS	11,976 71 13,795 81
OPERATING COSTS	47,422 279 54,208 319
OPERATING SURPLUS	74,578 439 86,792 510
SHARE ALLOCATION	34,621 204 40,235 237
TOTAL OPERATING SURPLUS	39,957 235 46,557 273
Repairs	11,612 68 12,800 75
Gear	6,341 37 7,000 41
NET PROFIT BEFORE INT & DEP'N	22,004 130 26,757 157

TABLE 10

EFFECT ON LANDINGS AND INCOME FOR THE- N.I. FLEET BY THE NTT DU-CT-ION OF EEZ QUOTAT9 TO THE MAIN MERSA SPYC=

A) QUOTA ALLOCATION BASED ON 1982 SHARE

Species	Probable Quota N.I.Share 1982 Tonnes	£'000	N.I.-Quota U.K. Quota 3	of U.K. Tonnes	£'000	Variance Tonnes	£'000
Cod	3885	1501.0	6400	51.0	3264	1261.0	- 621	-240.0
Plaice	161	54.4	2300	5	12	4.1	- 149	- 50.3
Sole	34	56.5		10.0	34	56.5	-	-
Whiting	9934	1885.9	9600	88.0	8448	1603.8	- 1486	-282.1
Hake	385	386.1	3800	12.0	456	457.3	+ (71)	+(71.2)
	14399	3883.9	12214	3382.7	-2185	-501.2		

VARIANCE ANALYSIS ON 1982 LANDINGS	DEMERSAL ONLY	ALL PELAGIC PRAWN & DEMERSAL LANDINGS
1. Volume Reduction	15.28	6.58
2. Income Reduction	12.9%	5.4%

SHOULD UK COD QUOTA BE REDUCED TO 3200 TONNES (SEE B)

1. Volume Reduction	26.58	11.48
2. Income Reduction	29.1%	12.2%

B) EFFECT ON LANDINGS & INCOME BY INTRODUCTION OF QUOTA CONTROL IN NORTHERN IRELAND - COD QUOTA AT 3200 TONNES

Species	1982 Tonnes	£'000	Quota U.K. Tonnes	N. I. Share U.K. Quota 8	N.I. Landings Quota Tonnes	£'000	Variance Tonnes	£'000
Cod	3885	1501.0	3200	57.0	1632	630.5	2253	870.5
Plaice	161	54.4	2300	0.5	12	4.1	149	50.3
Sole	34	56.5		10.0	34	56.5	-	
Whiting	9934	1885.9	9600	88.0	8443	1603.8	1486	282.1
Hake	385	386.1	3800	12.0	456	457.3	(71)	(71.2)
	14399	3883.9	.. 10582	2752.2	3817	1131.7		

VARIANCE

A) Volume: Reduction/Demersal Only

Tonnes 3817 = 26.58 Reduction on 1982 Landings - Demersal

B) Value ('000) E1132 = 29.18 Reduction on 1982 Income - Demersal

C) Volume Reduction Related to Pelagic, Demersal and Prawn Landings = 11.4%

D) Revenue Reduction Related to Pelagic Demersal and Prawn Income = 12.2%

APPENDIX I.

STATUTORY RULES AND ORDERS OF NORTHERN IRELAND

1973. No. 499

FISH INDUSTRY - Assistance to Fisheries Co-operatives Scheme (Northern Ireland) .1973

'Made , 11th December 1973

Coming into operation ,. lst March 1974

To be laid before the Parliament of the United Kingdom larder paragraph 4(S)(b) of the Schedule to the Northern Ireland (Temporary Provisions) Act 1972.

The Ministry of Agriculture (hereinafter called "the Ministry") on behalf of the Secretary of State in exercise of the powers conferred on it by section 2 of the Fish Industry Act (Northern Ireland) 1972(a) (hereinafter called "the Act") and of every other power enabling it in that behalf and with the approval of the Ministry of Finance hereby makes the following Scheme:

1. This Scheme may be cited as the Assistance to Fisheries Co-operatives Scheme (Northern Ireland) 1973 and shall come into operation on l st March 1974:

2. Subject to the provisions of this Scheme the Ministry of Agriculture may make to any body of persons carrying on or proposing to carry on a co-operative enterprise in the fishing industry, a grant towards the approved expenditure incurred by that body for the purposes of that enterprise.

3. The expenditure towards which a grant may be provided under this Scheme in connection with a co-operative enterprise is- . , , (a) the provision of

(i) any buildings (including any ice plant, fish hatchery, o'r mollusc purification plant) or fixed equipment;

(ii) any vehicle constructed or adapted for the conveyance or haulage . of loads in or about private premises for use in connection with that enterprise;

(b) the.provision of administration (including management) and training during the first three years after the date of making the first application. in respect of grant for such an enterprise;

(c) the acquisition of-any stock-in-trade during the first three years after the date of making the first application in respect of grant for such .an . enterprise and any expenditure incurred during such three years for

the purposes of such enterprise in respect of wages, salaries, the heating, lighting, repairing or redecoration of any.premises used for the purposes of or in connection with such enterprise, or for rates on such premises or the acquisition, repairing or renewal of any fixed plant or machinery or chattels used for the purposes of or in connection with such enterprise;

(d)

provision of any vessel or the improvement of any existing vessel used for the protection of any fishing rights owned by such an enterprise.

(a) 1972: c. 4 (N.I.).

4. The rates of grant payable under Article 3 shall be=
-' (a) in the case of the provision of any buildings or fixed equipment forty per cent. of approved expenditure and in the case of the provision of any other equipment or vehicle thirty per cent. of approved expenditure;
(6) in the case of administrative and training expenses sixty per cent, in the first year, forty per cent. in the second year and twenty per cent. in the third year of certified and approved expenditure;
(c) in the case of any item specified in Article 3(c) hereof twenty per cent. of certified and approved expenditure;
(c!) in the case of the provision of any vessel or vessel improvements thirty per cent. of approved costs.
S. 'Under Article 4 "certified" means certified by a member of a body of accountants for the time being recognised for the lnIrposcs of section 155(1)(a) of the Companies Act (Northern Ireland) 1960(b) by the Ministry of Commerce.
6. Applications for grant under this Scheme shall be made in writing in such form as the Ministry may from time to time require.
7. Applications for grants under this Scheme may be made only by bodies the majority of whose members are resident in Northern Ireland and whose registered offices are situated in Northern Ireland.
8. Applications for grants under this Scheme in respect of buildings, equipment, vehicles, and boats shall be accompanied by appropriate plans and specifications and a completed tender or tenders relating to the expenditure incurred and the form of contract or contracts to be entered into between the applicant and the builder supplier or other contractor and no contract shall be placed without the prior approval of the Ministry.
9. The Ministry may require any applicant,for a grant to provide more than one tender.
].0. Any person authorised by the Ministry shall have the right to inspect at all reasonable times within the control period any building, vehicle, boat or equipment in respect of which a grant has been or is to be made.
11. If any person makes a false statement or furnishes false information in respect of any of the matters required to be disclosed in connection with an application for a grant or if any of the conditions relating to the payment of
grant are not complied with by an applicant any payment of or on account of a grant to that applicant may at any time be refused and any such payment already made in relation to that application may be recovered by the Ministry.
12, Any body whose application for grant under this Scheme is approved by the Ministry may be required to give such undertakings as the Ministry may consider appropriate and in particular shall be required
(a) where the grant exceeds £300 to insure any building, vehicle, boat or equipment in respect of which -a grant has been made and keep them insured against such risks and in such sums as required by the . Ministry during the control period;
(b) 1960. c. 131 (N.I.).

(b) to keep and make available for inspection by the . Ministry, at- all reasonable times during the control period any books, records or other, documents necessary to enable the Ministry to satisfy itself that the conditions of the grant have been complied with.
(c) if within the control period
(i) there occurs the total or partial loss or destruction of any building, vehicle, boat or equipment in respect of which a grant has been made arising out of any insured risks, to repay to the Ministry the whole or such portion of the grant as the Ministry may require;
(ii) there occurs a breach of any undertaking or condition subject to which the grant was made or a disposition by way of mortgage or sale of any building, vehicle, boat or any part thereof or of any equipment used on or in connection therewith in respect of which a grunt Bets been nigdc, to repay to the Ministry such proportion of the grant as the Ministry may require;
(iii) the body ceases to operate as a co-operative enterprise within the meaning of section 2(2) of the Act, to repay to the Ministry such proportion of the grant as the Ministry may require.
13. If any body receives grant under this Scheme and that body ceases to be registered un(ler the Industrial and Provident Societies Act (Northern Ireland) 1969(c) all persons who were members of that body between the date of the body's: first application for grant under this Scheme and such cessation of registration shall be jointly and severally liable to repay to the Ministry such proportion of the grant as the Ministry may require.
14. For the purposes of this Scheme the "control period" in relation to any grant shall mean a period of
(a) in the case of any building or the provision of any vessel a period of 10 years commencing with the date on which the final payment of grant was made;
(b) in any other case a period of 5 years. commencing with the date on which the final payment of grant was made.
15. No grants under this Scheme shall be made towards expenditure
(a) in respect of which any person is entitled under any other statutory provision to a payment for a purpose similar to any of .the purposes mentioned in the Scheme;
(b) in respect of which any grant has been made under any other statutory provision;
(c) on second-hated buildings, boats, vehicles or equipment.
16. A grant exceeding £1,000 shall not be made without the approval of the Ministry of Finance.
(c) 1969. c. 132 (N.I.).

Sealed with the Official Seal of the Ministry of Agriculture for Northern Ireland this 5th day of December 1973.

(L.S.) J. Parke,

Assistant Secretary.

The Ministry of Finance on behalf of the Secretary of State hereb3 approves the foregoing Scheme. '

Sealed with the Official Seal of the Ministry of Finance for Northern Ireland this 11th day of December 1973,

(L.S.) *A. J. Green,*

Assistant Secretary,

EXPLANATORY NOTE

(This note is not part of the Scheme, but is intended to indicate its general purport.)

This Scheme provides for the payment of grant to co-operative enterprises in the fishing industry and lays clown the purposes for which grant may be paid and the rates of grant payable,

The Scheme also specifies requirements to qualify -for grant and -provides for repayment to the Ministry of Agriculture in certain circumstances of all or part of any grant.

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ISBN 0 337 83499 7

APPENDIX II

REFERENCES

1. Northern Ireland Market for Fish - Consumer Survey February 1983.
2. Northern Ireland Market for Fish - Catering Survey March 1983.
3. Fishing Prospects 1983 MAFF.
4. Irish International Trawling Co. Ltd. - Proposals for Londonderry 1969.
5. EEC Council Resolution No. 3796/81

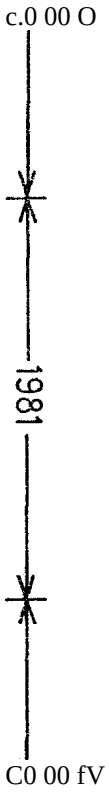
APPENDIX III

ACKNOWLEDGEMENTS

The SFIA gratefully acknowledge the co-operation of the following organisations who have participated in this study.

Department of Agriculture for Northern Ireland - Fisheries Division.
Northern Ireland Fishery Harbour Authority.
Northern Ireland Fish Producers Organisation.
North Irish Sea Fish Producers Organisation.
Fish Processors and Exporters Associations.
Fish Fryers Association.
Fishmongers Association.
Fish Processing Companies.

Acknowledgement must also be made to the many individuals throughout the Industry without whose co-operation this report could not have been completed.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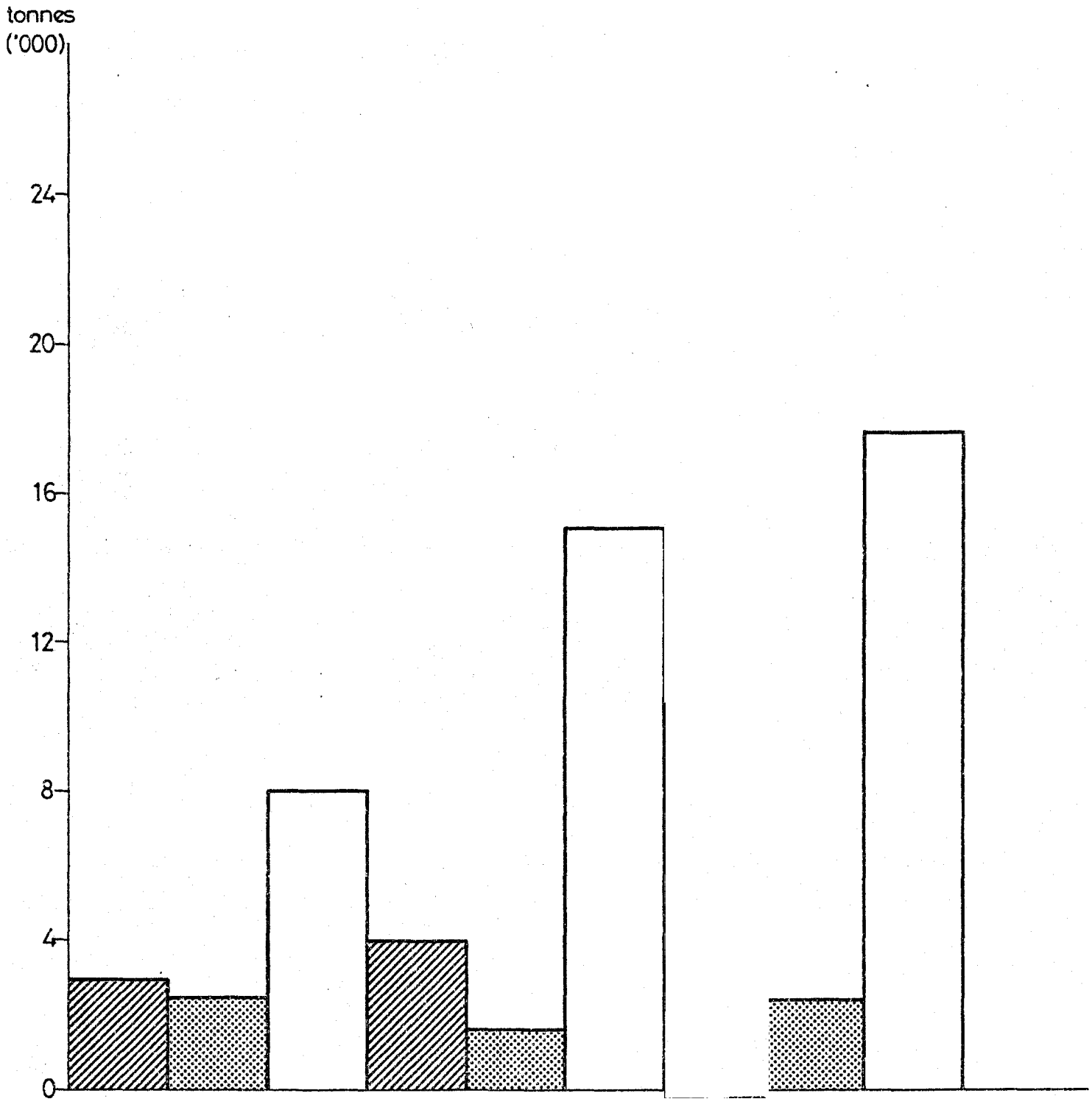
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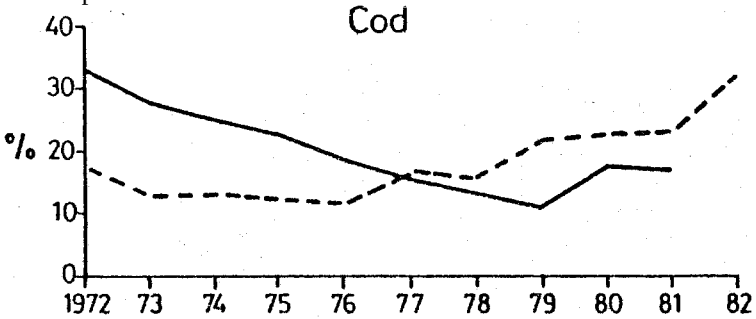
Fig. 2. Percentage Of International Catch
North Iris Sea Landings - England &Wales
Main Species 1972 - 82 - -- - - Northern Ireland



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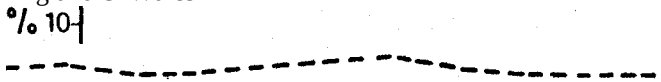

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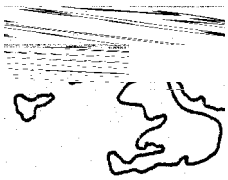

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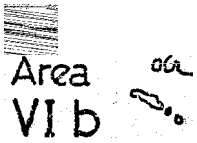

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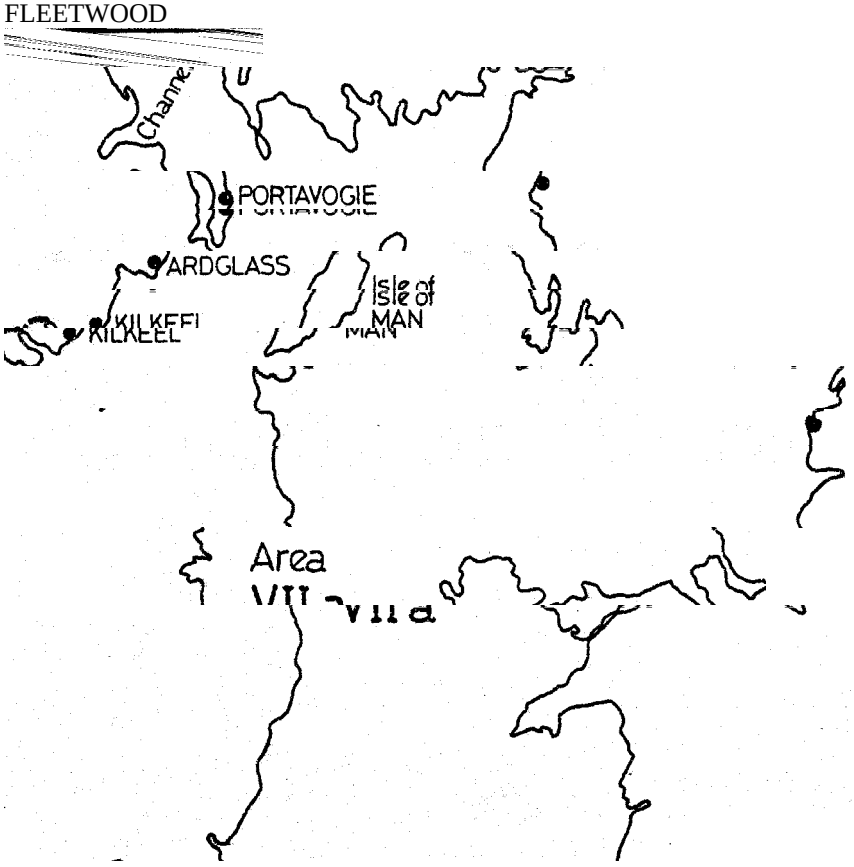

Fig. 3 Fishing Areas of Northern Ireland

Fig. 4 Breakdown of Whiting Catches
Area VIIa Irish Sea, proportionate catch data England and Wales, Republic of Ireland and Northern Ireland respectively x 100% 1981 (ICES).
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Republic of Ireland 37°10

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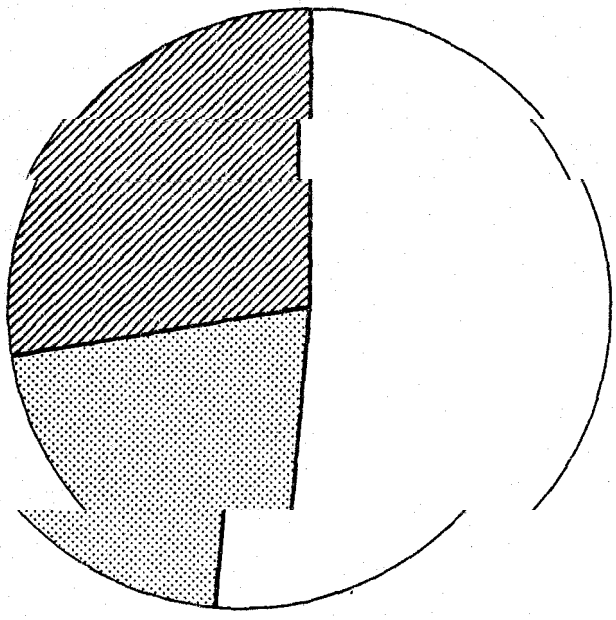
Northern Ireland 58010
Fig. 5
Breakdown of Cod Catches
Northern Ireland 27°l0



England & Wales 220/.
Republic of Ireland 51°10

Fig. 6
Breakdown of Nephrops Catches

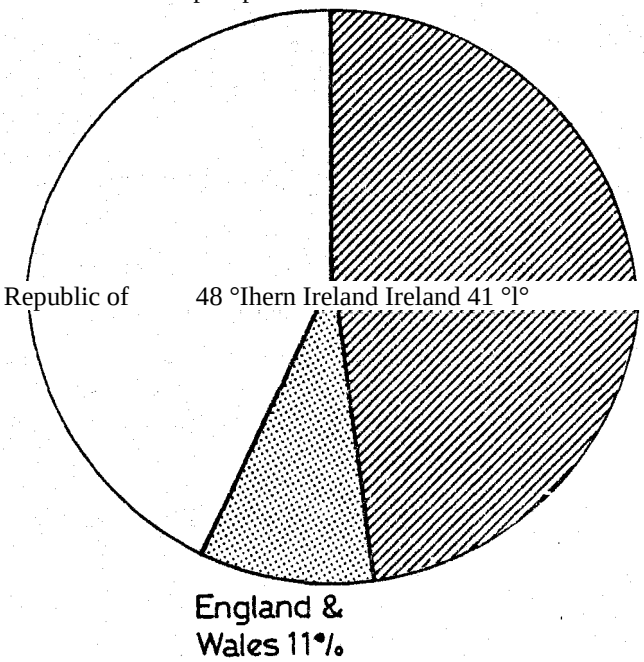
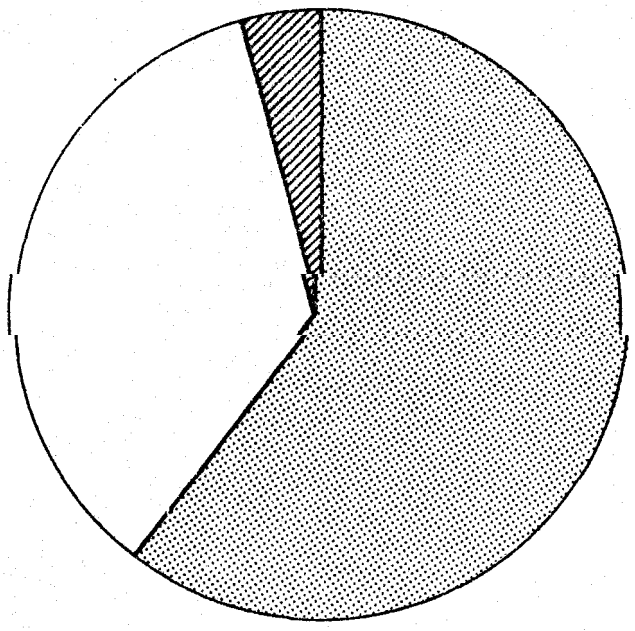
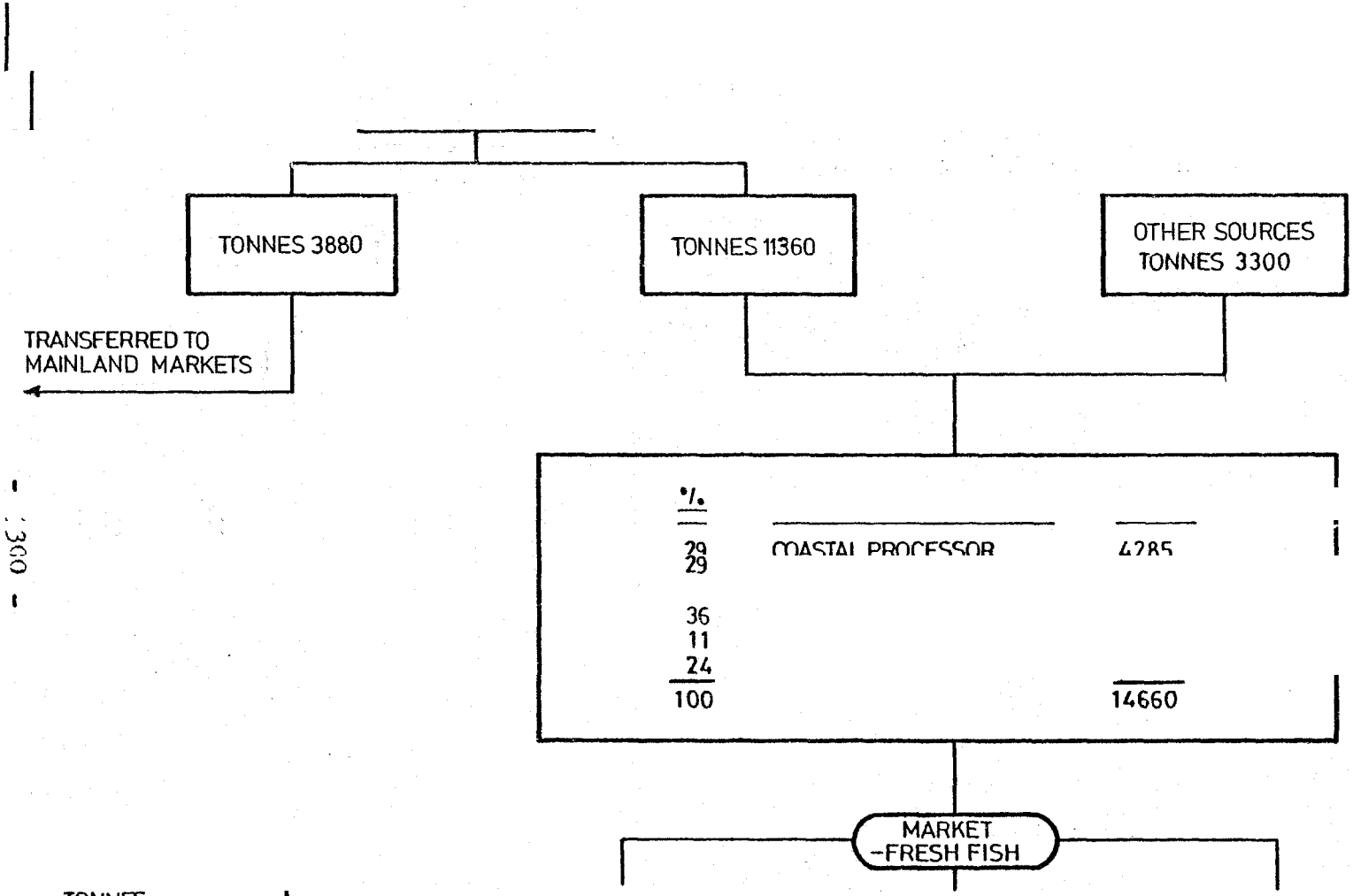


Fig. 7
Breakdown of Plaice Catches



Republic of Ireland 36 °I°
Northern Ireland G°la
England &Wales 60%

Fig. 8 NORTHERN IRELAND
ANALYSIS OF ESTIMATED FRESH DEMERSAL SUPPLY AND DEMAND LANDED WHOLE FISH EQUIVALENT
1981 TOTAL SUPPLIES
BY N.1, FLEET TONNES 15240
PROCESSING/ WHOLESALE

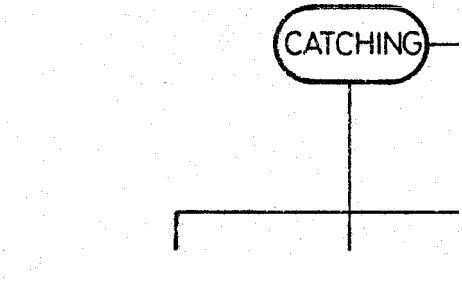


COASTAL PROCESSOR BELFAST WHOLESALE - MARKET - - OTHERS HAWKERS
RESTAURANTS 8. FRIERS INSTITUTIONS RETAIL

20.4'/.	5.2'/.	74.4 '/.
3000	760	10900
TONNES	TONNES	TONNES

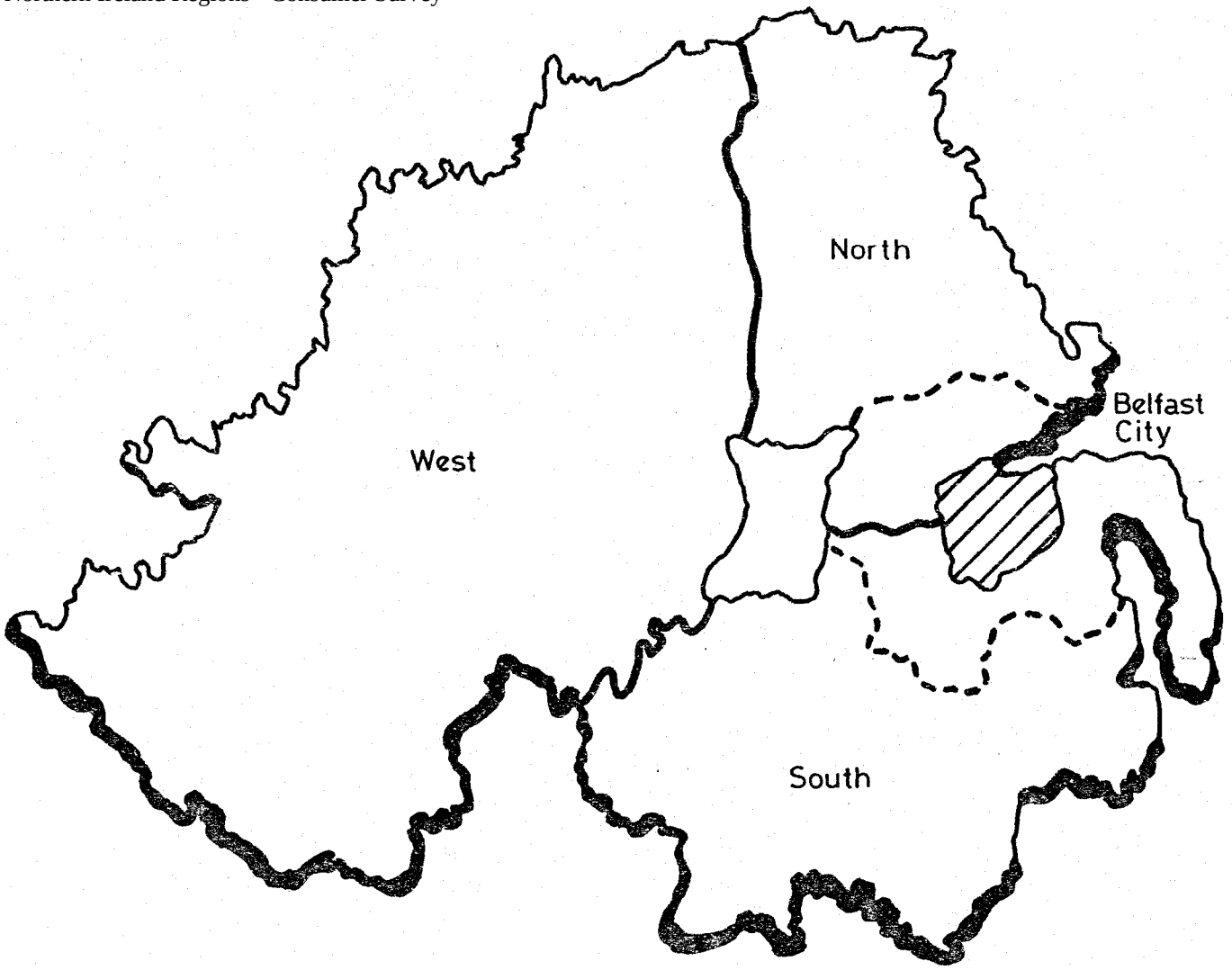
FISHMONGERS	SUPERMARKETS	OPENMARKET & M0131LES
47 '/.	17•4	36%

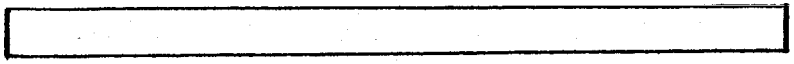
Fig.9
N. I. FISH TRADE ORGANISATIONAL STRUCTURE
MINISTRY and STATUTORY BODIES I
D.A.N:I.S.F I.A.
N I FHAFisheries Division Coleraine
I Laboratory
TRADE ASSOCIATIONS
N.I. Fish Producers Organisation
PROCESSORS/MERCHANTS RETAIL

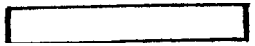
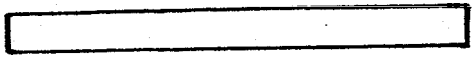


North Irish Sea Fish Organisation
US FA Ulster Sea Association
Fish Processors & Exporters Assoc'n.
Fish Mongers Association
Fish Fryers Association Producers Fisheries

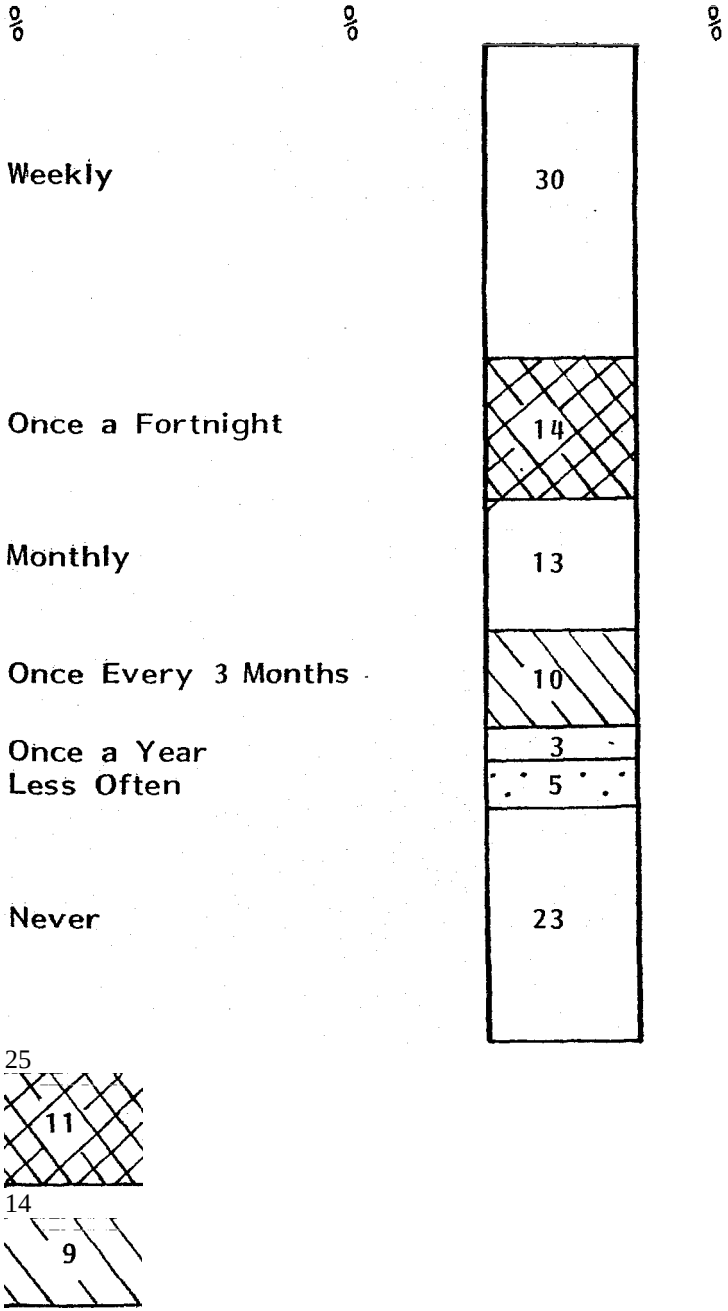
Figure 10
Northern Ireland Regions - Consumer Survey



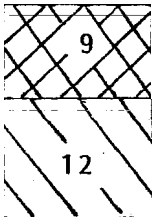
FOOD TYPES BOUGHT IN PAST WEEK
Base: 493 Housewives
FIG. 11
Fresh Fish

39
Frozen Fish
32
Canned Fish

15
Smoked Fish

12
Beef /Steak
Pork
43
Lamb

23
CONSUMER SURVEY

FREQUENCY OF PURCHASING FISH TYPES
.Base: 439 Housewives
FIG. 12



4
' 4 '
32
13

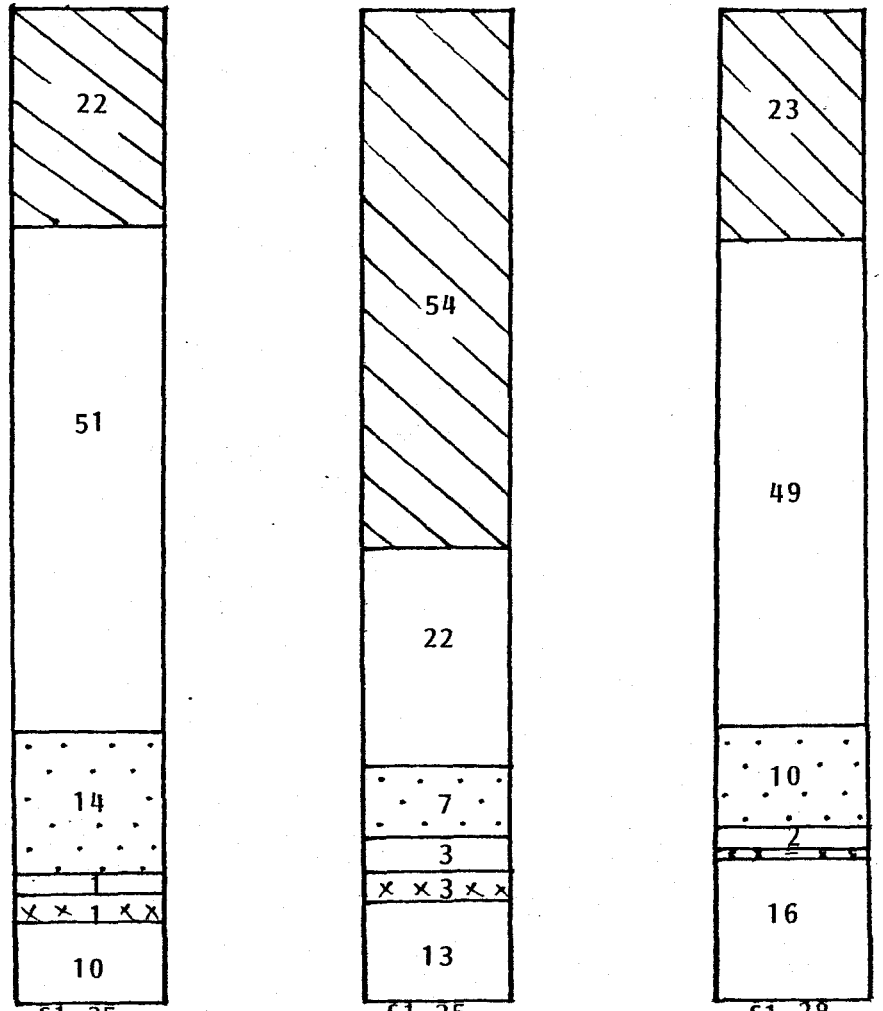


3

41
CONSUMER SURVEY

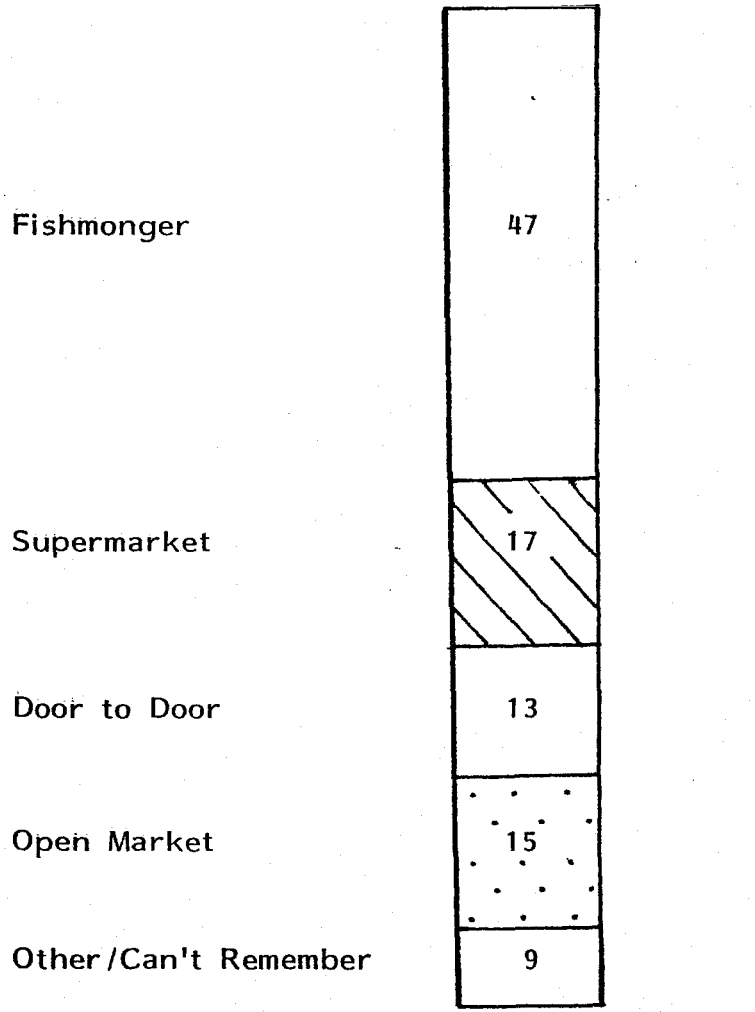
AMOUNT SPENT ON LAST PURCHASING OCCASION
Base: All Purchased Fish Type in Past Year
FIG. 13

	FRESH	FROZEN	SMOKED
Base:	349	310	235
99p and Under	0	0	0
£1.00 - £1.99	0	0	0
£2.00 - £2.99			
£3.00 - £4.99			
£5. 00+			
Don't Know /Not Sure			
Average			

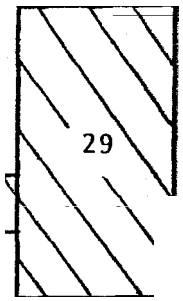


CONSUMER SURVEY

LOCATION OF LAST PURCHASE - FRESH FISH
(All Bought Fresh Fish in Past Year)
FIG. 14
TOTAL
AREA
Belfast North South West
Base: 349 _ 110 56 104 79
0 0 o



55	48	49	32
			Nkk
		6 i	
1			I k
o		21	F
\			15
F-	16	22	
8	15	- .	15



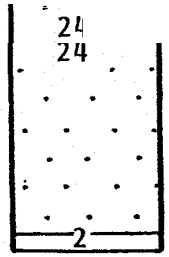
CONSUMER SURVEY

TRENDS IN BUYING FISH
(All Housewives) FIG. 15
TOTAL CLASS AGE

Base: 493

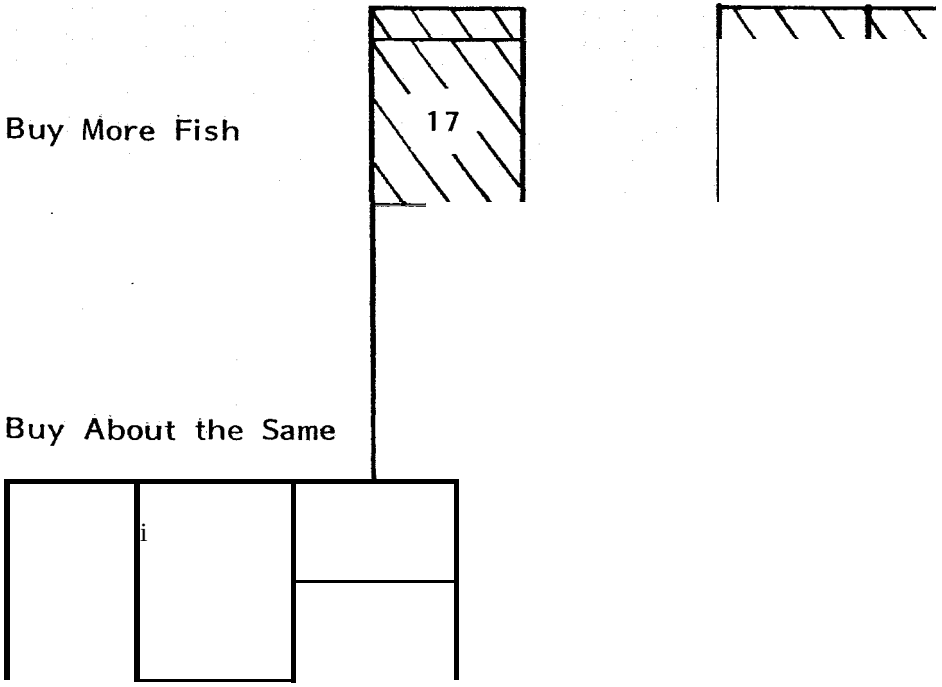
%

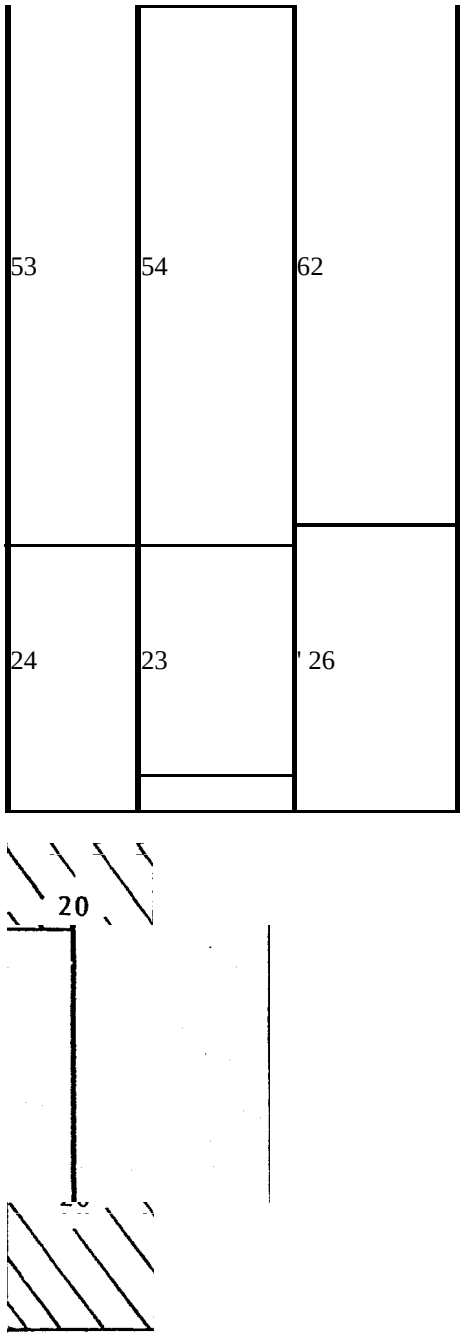
Buy Less Fish

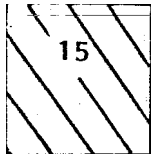


Don't Know/Not Sure

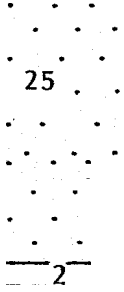
ABC1	C2	DE	Under 34	35+	193	127	173	178	315
0	0								
0	0								




53
54
62
24
23
' 26
20



59
56
52
3
:24..
CONSUMER SURVEY



REASONS FOR TRENDS IN FISH BUYING
(All Buy More./Less Nowadays)
FIG. 16

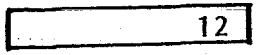
	BUY MORE	BUY LESS
Base:	84	120
0	0	
0	0	

Diet/Health

37
Family Not Keen/ Don't Eat

30
Acquired Taste/ Children Like It

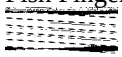
33
Self Not Keen
Good Value
T5 I
On Own/ Smaller Family Now



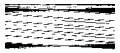
Habit/Routine

Fish More Expensive

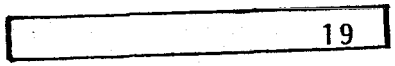
9
Convenience
Fish Fingers etc.



Trouble to Cook/ Don't Like Cooking



Others /Don't Know



Others /Don't Know
23
CONSUMER SURVEY

FOODS SERVED REGULARLY
(All Outlets)
FIG. 17
RESTAURANT CARRY-OUT
Fish

%

%

93

97

Poultry

92%

91

93

Beef

77%

93 60

Pork

52%

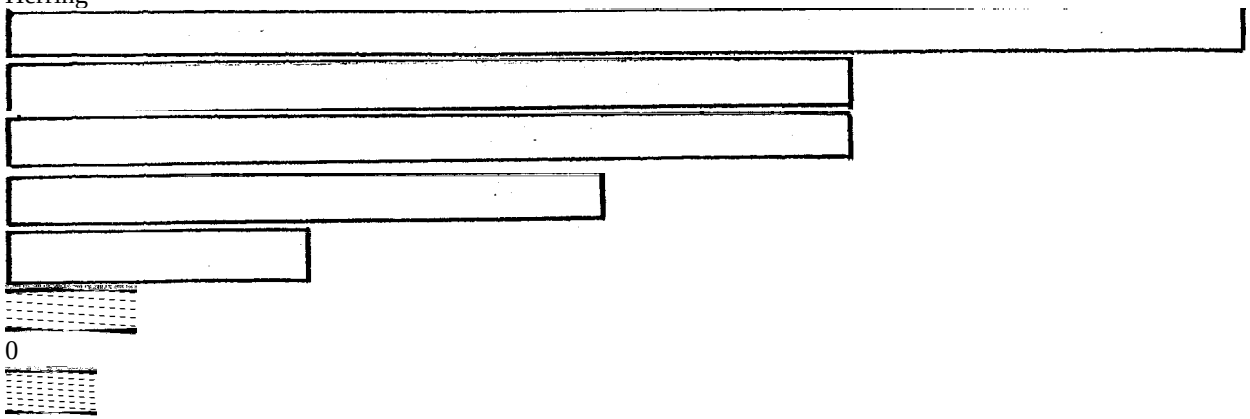
78 25

Lamb

31%

59 1 CATERING SURVEY

FISH TYPES SERVED REGULARLY
FIG. 18
(All Outlets Serve Fish)
Whiting
Plaice
Cod
Prawns
Haddock
Sole
Clams/Shellfish
Mackerel
Lobster
Herring



0

30%
42%
42%

RESTAURANTS	CARRY-OUTS
a	a
s	0
% 39	85
68	17
39	44
54	7

18 11

24

21

11

10

7

6
CATERING SURVEY

EXPENDITURE ON FOOD TYPES - RESTAURANTS (76)
FIG. 19

	WEEKLY AVERAGE PER OUTLET-	GROSS ESTIMATED WEEKLY EXPEND- ITURE-- -	ANNUAL MARKET VALUE (Wholesale Prices)
Beef	£36.75		
Poultry	£84. 93		
Fish	£86. 62		
Pork	£161.43	£12,269	£6.4 m.
	E6,583		0.4 m.
	£6, 455		£3. 4 m.
	£2,793		£1.4 m.

£2,144 El. l m.

Lamb I I £28. 21
CATERING SURVEY

EXPENDITURE ON FOOD TYPES - CARRY-OUTS (73)

FIG. 20

WEEKLY AVERAGE PER OUTLET ..	GROSS WEEKLY EXPEND- I TURF	ESTIMATED ANNUAL MARKET VALUE
£	£	£
Fish		
£134.15		
£9,793 £2.7 m.		
Poultry		
£76. 68 E5,598 El. 5 m.		
Beef		
£40. 38		
E2,948 £0. 8 m.		
Pork M £8. 49 £620 CO. 2 m.		
Lamb £0.14		
£10 £3, 000 CATERING SURVEY		

EXPENDITURE ON FISH TYPES - RESTAURANTS (76)
FIG. 21

	WEEKLY AVERAGE EXPENDITURE	GROSS WEEKLY EXPEND-ITURE	ESTIMATED ANNUAL MARKET VALUE (Wholesale Prices)		
				£	£
Prawns			£29. 22	C2,221	E1.2 m.
Plaice		£19. 23		E1,462	£0. 8 m.
Whiting		£12. 06		£917	£0.5 m.
Sole	£6.28			£477	£0.3 m.
Cod	£6.20			£471	£0.2 m.
Clams/Shellfish	£5. 45			£414	£0. 2 m .
Lobster	£2. 45			£186	£0.1 m.
Haddock	£1.80			£137	£0.05 m.
Mackerel	£1.32			£100	£0.05 m.
Herring	p £0. 92			£70	£0.04 m.

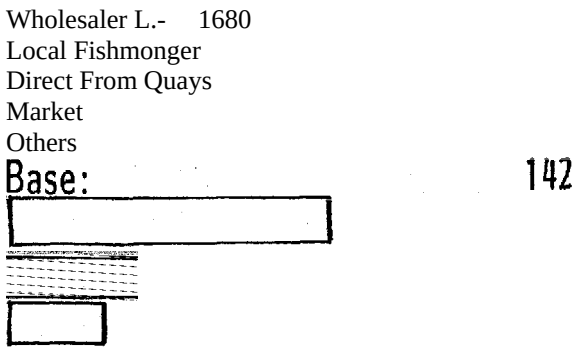
CATERING SURVEY

EXPENDITURE ON FISH TYPES - CARRY-OUTS (73)
FIG. 22

	WEEKLY AVERAGE PER OUTLET	GROSS ESTIMATED WEEKLY EXPEND- ITURE	ANNUAL MARKET (Wholesale Prices
	£	£	£
Whiting L-- Cod	_ _ _ _ _	£95.71	£6,978 £1.9 m.
[redacted]	£20. 49	E1,496	f0.4 m.
Haddock 0	£3.83	£280	£0.1 m.
Plaice	£2. 62	£191	£0.05 m.
Others	£10. 96	£800	£0.2 m.
TOTAL			£2.7 m.

CATERING SURVEY

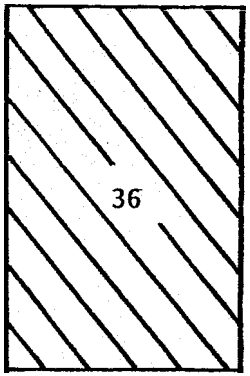
MAIN SUPPLIERS OF FISH FIG 23



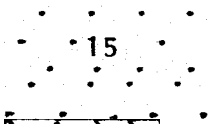
OUTLET TYPE		LOCATION	
Rest-aurant	Carry-Out	Greater Belfast	Rest of Northern Ireland
71	71	48	94
%	%	%	%
66	69	52	76
24	15	40	10
10	7	2	12
4	7	13	2
7	1	-	6

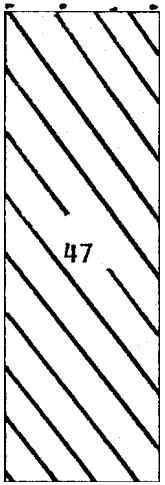
PERCEIVED POPULARITY OF FISH
FIG. 24
(All Outlets)

	TOTAL	OUTLET TYPE	
		RESTAURANTS	CARRY-OUTS
Base:	149	76	73
	0	0	
	0	0	
Fish is More Popular Nowadays			
About the Same Popularity			
Fish is Less Popular Nowadays			
Don't Know/Not Sure			

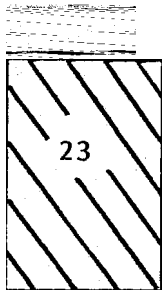


48





45



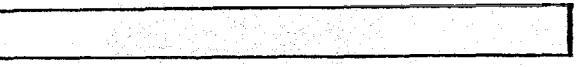
52

23

CATERING SURVEY

ood For You/ Dietary Reasons

EASONS FOR POPULARITY
ORE POPULAR- NOWADAYS LESS POPULAR NOWADAYS



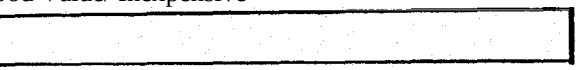
%

oung People Choose Hamburgers /Hot Dogs etc.

G 2

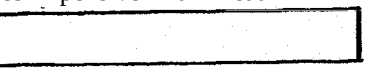
%

ood Value/ Inexpensive



%

ss Expensive Than Meat

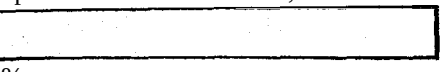


ore Variety Available

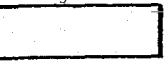
%

ore Variety
ore Fresh Fish Available

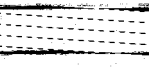
eople Choose Chicken/ Pies, etc.

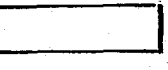


%
ne Way We cook I t



ellfish Becoming More Popular
eople Like Fish
an Keep It Fresh Now
% s





8%

2%

ess Eatable/Messy/
convenient

CATERING SURVEY