

## NOTE

### Sampling Plans for Pre-packed Fish and Fish Products

The Indian Standard Institution has brought out 41 standards on fish and fish products. Some of these standards provide sampling plan for inspection and it varies with product and type of pack. To make the inspection of fish and fish products easier and more effective, we have developed a sampling plan for pre-packed fish products based on the net weight of the container and reported in this communication.

The total quantity of frozen shrimps, frozen frog legs, lobster tails, dry fish, canned shrimps, shark fins and fish maws, frozen pomfrets, squid and cuttle fish inspected and rejected, during pre-shipment inspection were collected for 1980-81 (From April 1981 onwards inspection and rejection were on consignment basis and the total quantity inspected and rejected were not recorded).

The process average of the products were estimated for the following three groups based on the weight of the containers.

1. Net weight of the container is equal to or less than 2.5 kg.
2. Net weight of the container is greater than 2.5 kg and less than or equal to 5 kg.
3. Net weight of the container is greater than 5 kg.

The process average for the first two groups was between 1 and 2% (more exactly, 1.48% and 1.69% respectively). Since the sampling plans for process average ranging between 1 and 2% does not differ appreciably (Dodge & Romig, 1959), these two groups were combined to form a single group with a process average of 1.5%.

Thus the number of groups were reduced to two

1. Net weight of containers less than or equal to 5 kg with a process average of 1.5% and

2. Net weight of containers greater than 5 kg with a process average of 7.53%.

For working out the sampling plan, the average quality protection was chosen (Dodge & Romig, 1959; Kramer & Twigg, 1962). The average outgoing quality level (AOQL) was taken as 5%. Even though in the FAO/WHO *Codex Alimentarius* sampling plans (FAO, 1969) for pre-packaged foods, the acceptable quality level (AQL) was fixed as 6.5%, to cover the risk of deterioration of the products during transport and successive storage before it reaches the consumer, the AOQL was taken as 5% for developing the sampling plan.

#### *Sampling plan and illustration*

The single sampling plan developed on the basis of average quality protection with an AOQL of 5% and a process average of 1.5% for net weight of containers upto 5 kg and 7.53% for net weight of containers above 5 kg are given in Tables 1 and 2 respectively. As the lot size increases, the sample size and acceptance number also increase.

**Table 1.** *Single sampling plan for fish products (AOQL 5%), when net weight of the container is equal to or less than 5 kg*

Lot size (N)	Sample size (n)	Acceptance number (c)
100 or less	7	0
101— 500	16	1
501— 2,000	27	2
2,001— 7,000	39	3
7,001— 20,000	50	4
20,001— 50,000	65	5
50,001—1,00,000	75	6

**Table 2.** *Single sampling plan for fish products (AOQL 5%) when net weight of the container is greater than 5 kg*

Lot size (N)	Sample size (n)	Acceptance number (c)
100 or less	14	1
101— 300	25	2
301— 400	35	3
401— 600	47	4
601— 800	60	5
801— 1,000	70	6
1,001— 2,000	85	7
2,001— 3,000	125	10
3,001— 4,000	140	11
4,001— 5,000	155	12
5,001— 7,000	185	14
7,001— 10,000	225	17
10,001— 20,000	305	22
20,001— 50,000	400	28
50,001—1,00,000	450	31

#### *Illustration*

A lot consists of 1000 master cartons packed into 10 x 2 kg frozen block per master carton. How many samples to be drawn for inspection and what is the acceptance number?

#### *Solution*

Lot size, N      1000 x 10 = 10,000  
                              blocks  
Weight of each    2 kg  
                              block  
Referring to Table I we find that,  
Sample size, n    50  
Acceptance no. c 4

In this example, if there are not more than four defective blocks in a sample of size 50, the lot is acceptable and in case of five or more defectives, the lot is considered as failing to meet the requirements.

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#### **References**

- Dodge, H. F. & Romig, H. G. (1959), *Sampling Inspection Tables*, 2nd edn. John Wiley and Sons, New York
- Kramer, A. & Twigg, B. A. (1962) *Fundamentals of Quality Control For the Food Industry*, AVI Publishing Co. Inc., West Port, Connecticut
- FAO (1969) *FAO/WHO Codex Alimentarius Sampling Plans for Pre-packaged Foods*, pp. 15

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