

Design of a Detachable Type Fish Drier

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The paper describes the design of a detachable type fish drier which has been designed to operate on commercial scale. The drier with a raw material capacity of one tonne has been designed after effecting all improvements on the design of the existing tunnel driers available in India. The cost of one drier works out to Rs. 2,16,700/- approximately.

Even though preservation of fish by sophisticated means such as freezing and canning is adopted and widely practised, drying still continues as the simple and cheapest mode of preservation especially during the fishing season when bulk quantities have to be processed. The traditional method of drying under open sun is still prevalent. However, sun drying poses difficulties especially during rainy seasons.

Prabhu *et al.* (1963) described a laboratory model tunnel drier developed at the Central Institute of Fisheries Technology, Cochin on which several studies to monitor drying parameters have been carried out by various research scientists. Based on the data collected from the laboratory model drier, a half ton drier was designed by Swaminath (1964). The body of the drier was of wood (Anjili). The air heating was provided with electrical heaters of 80 kw capacity and an axial flow pattern fan had been used to circulate the hot air over the fish.

The next attempt was done by Chakraborty (1977). In his design, the capacity has been raised to one ton and the basic structural arrangements of the drier was more or less similar to the one designed by Swaminath (1964) except that the body was of reinforced cement concrete instead of wood. The air was heated by steam or by electricity.

Design considerations

The performance of the laboratory and commercial models were observed. For a longer life and safer operation the wooden construction has to be avoided and more-over wood is no longer cheap. As regards R.C.C. construction, even though it is quite

sturdy and long lasting and with sufficient insulation properties it becomes a permanent structure so that the fabrication has to be done perfectly as no modifications are possible afterwards. It occupies more space, not cheaper and is not possible to shift it to some other locality if needed. The major drawback of this drier is the uneven distribution of air inside the drying tunnel as the heated air has to turn around by 180° before reaching the drying tunnel. Even though air-deflectors have been provided it has been observed that there is still air at the top of the hot air entry end of the tunnel. The trolleys are very heavy as each trolley has to carry 200 kg of fish over and above its own weight and extra railings on both ends of the drier are required to push them into and pull out of the drier. Considering all these, it has been decided to improve the design features of the drier.

Details of improved drier

In order to simplify the construction and to enable shifting of the drier to suitable localities in future, the drier body has been designed with fibreglass for the inner walls and G.I. sheet for outside with 50 mm thick fibreglass resin bonded slabs for the insulation in between. The drier body has been made up of four pieces for easy transportation, installation and easy dismantling if needed. The overall dimensions of the drier body are 7.1 m long 1.35 m wide with a height of 2.35 m as illustrated in Fig. 1. There is a partition wall made up of G.I. sheet at a height of 2 m which separates the drying tunnel from the air circulating upper chamber. Instead of the doors on two ends of earlier designs, there are two insulated

report any rancidity possibly because of the nature of the fat contents. There were initial reductions in TCB which later increased and eventually surpassed the original counts. Similar observations were made by the authors for 5 more fishes (Bandyopadhyay *et al.* 1982). Initial reductions in TBC were due to leaching and cold shock, after which psychrophiles dominated.

The muscle pH for both the fishes increased from their initial values showing cyclic changes. Like other fishes, therefore, pH cannot be considered as an index of freshness for these two fishes as well.

It was observed that the first distinct physical changes occur after 3 and 4 days for *C. catla* and *L. fimbriatus* respectively when ice stored. Both are acceptable for 9 days in terms of organoleptic qualities of raw whole fish and 18 days in terms of organoleptic qualities of their cooked meats.

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