1 Raw material sourcing
P. HARRIS

1.1 Introduction

There are more than 20,000 different species of fish in the world, but less than 200 of them are of commercial significance. Almost without exception, the fish which are used for canning come from the sea (as opposed to freshwater or farmed fish), this means that they are ‘wild’ and therefore have to be hunted. Because the fish are wild there is only limited control over the quality of these fish with regard to nutritional state etc., in contrast to farmed fish or animals, whose rearing, whether for fish or meat, is controlled as the first stage in the manufacture of fish or meat products.

The quality of fish will vary according to the season when the fish can either be well fed or spawning, when a significant proportion of the fish flesh is converted to reproductive tissue, thus making the fish of poorer quality. Most fish species are fragile and can be easily damaged leading to rapid spoilage and loss of original quality. Also, fishing is governed by the weather which means that the availability of fish to a cannery can be uncertain.

Sea fish are often classified according to the part of the sea in which they normally live, this in turn will influence the type of method used for catching them. Demersal fish live mainly on the sea bottom and typical examples are cod, haddock, whiting and the flat fish. Pelagic fish live in the middle and surface waters of the seas and examples of these are the herring, mackerel, sardine and tuna. The demersal fish are mainly the ‘white’ fish, whereas the pelagic fish are mainly the ‘fatty’ fish, although there are many exceptions. The majority of fish which are canned are pelagic.

This chapter will cover the main fishing methods which are used to catch fish for canning, and list some of the on-board handling procedures and their influence on the quality of the fish.

1.2 Supply of fish

Until the end of the last century, it was considered that the supply of fish from the seas was limitless. Therefore, fish in the sea were common
property and did not belong to anybody; they only became property by the law of capture. With the advent of steam-powered fishing boats came the ability to catch vast quantities of fish and thus the capability of overfishing. This ability to overfish and deplete stocks of particular species to such an extent that fishing for that species was no longer viable, lead to countries claiming ‘ownership’ of the seas, first by the 3 mile then 200 mile limits. This was supplemented by stock surveys which were used to set total allowable catches (TAC) and quotas of that TAC to be divided amongst the various countries; management of this TAC/quota system is by international treaty. The formation of the EU has improved the management of TAC and quotas within the community, but there are still many obstacles to overcome with the rest of the world.

The question of the continued supply of fish for the foreseeable future is still unresolved. Of 146 species of fish currently recorded by the FAO of the UN

- 7 species are underutilised,
- 39 species have some room for further exploitation,
- 49 species are fished to their maximum, and
- 51 species are overfished.

It is considered that 90% of the North Atlantic fish stocks are overfished, some by as much as four times the sustainable yield.

Most of the overfished stocks are demersal and not pelagic, which is good news for the canners!

### 1.3 Finding fish

Before a fisherman can catch the fish, he must first find them. There are two problems related to finding fish: (i) establishing their location in the vast ocean; and (ii) having got to the right part of the ocean, finding exactly where the fish are. Historically, these problems had to be overcome by the experience of the fisherman, either learnt or passed down from generation to generation. Over the years, knowledge would be built up of the relationship between the presence of fish and factors like time of the year, water temperature, and thermoclines or upswellings. Today, the use of satellites and on-board sensors and computers allow the monitoring and processing of such data to generate maps predicting the likely location of the target fish.

The task of finding pelagic fish is easier than for demersals because pelagic fish have the tendency to form shoals where large numbers of the same species gather together making location possible. Also, these shoals often swim so close to the surface as to create a surface pattern which renders the shoal visible from above. If the fish come close to the shore, as