Superchilling of fish: Long shelf-life, superior quality, low transportation costs.

Transportation and storage of chilled fish consume great amount of resources. Chilled salmon is transported by trucks on long distances. Usually, salmon is packed in the boxes together with ice. The ice fraction in the box is in the range between 20 % and 30% from the fish’ weight. The high quality shelf-life of chilled salmon is relatively short, which creates logistics problems.

The technology of the superchilling permits formation of ice crystals inside the product (from 10 to 30 % of water content). The temperature of fish will be in the range between -1.7 and -3.0 °C.

These creates following benefits:
- High yield and product quality during processing;
- Good product appearance;
- Reduced temperature & longer practical storage life when compared with chilled product (3 weeks vs. 2 weeks);
- Reduced transport weight & costs.
- Reduced environmental impact.

Key facts

Decreasing of the storage temperature increases practical shelf-life significantly. Below freezing point the ice formation starts. The excessive formation of ice crystals leads to the decreasing of quality. Thus superchilling should be done correct.

Incorrect methods of superchilling will result in formation of the ice crystals of a huge size in-between muscle cells. This will decrease quality significantly.

Proper design and choice of technology for superchilling process will result in small ice crystals inside muscle cells. This increases water holding capacity of the fish and decreases deteriorative reactions.

Outcome of the study:

The superchilling methods are beneficial for the increasing of the high quality shelf-life:
- The drip losses are stable and lower when compared with chilled salmon;
- The water holding capacity is stable during first two weeks of storage;
- Practical storage life can be increased up to 3 weeks.

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