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# EXPERIMENT 20 PREPARATION OF FISH SILAGE

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## 20.1 INTRODUCTION

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Fish silage is a liquefied form of fish or fish processing waste that is meant for incorporation into animal feed. It is a rich source of nutrients. It is preserved by acid that is either added to fish or produced by bacterial fermentation. The process of making silage is called ensiling. In this exercise, we shall prepare silage using formic acid.

### Objectives

After performing this experiment, you will be able to:

- prepare an acid fish silage; and
- understand the changes that occur during ensiling.

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## 20.2 EXPERIMENT

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### 20.2.1 Principle

Any cheap fish or processing waste can be used as raw material for making silage. It's cut up into small particles for efficient action of acid and enzymes, and mixed with sufficient quantity of acid in order to prevent any microbial attack (i.e. to preserve the material). On keeping at room temperature, some of the enzymes occurring in fish act upon (hydrolyze) the proteins making them soluble. The broken down compounds dissolve in the water contained in the fish itself, thereby liquefying the product. (Fish contains around 80% water).

### 20.2.2 Requirements

- Any cheap fish
- Formic acid (the acid available in the market is usually 85% concentrated)
- pH paper
- Plastic jar
- Balance
- Grinder

### 20.2.3 Procedure

- 1) Cut up the given fish into small pieces.
- 2) Grind in a wet grinder.
- 3) Weigh the material and transfer to a plastic jar of appropriate capacity.
- 4) Weigh formic acid at the rate of 3.5% of fish weight.
- 5) Add acid to the ground material. Mix thoroughly to ensure that acid reaches every part of the material.
- 6) Check pH using a pH paper. The pH must be well below a value of 4.0. In case it's higher, add more acid and mix.
- 7) Close the container tightly.
- 8) Keep at room temperature for a few days. Everyday open the container and check whether the ensiling process is going on normally or not. Then mix the material and close the container.
- 9) Once liquefaction has sufficiently occurred the product is ready. The silage may be stored in the same container.

### 20.2.4 Observations

Weight of ground fish =

Weight of formic acid used =

Concentration of acid =

#### *Characteristics noticed*

Liquefaction :

Odour :

Spoilage, if any :

### 20.2.5 Results

The quality of the fish silage prepared is .....

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## 20.3 PRECAUTIONS

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- It's essential to keep the pH of the material low enough – well below pH 4. If not spoilage of the product can occur during ensiling or storage.
- The container used must be closed air-tight so as to prevent any leakage of the product.