

EFFECTIVENESS OF BIOSTAT (OXYTETRACYCLINE HYDROCHLORIDE)  
IN MAINTAINING THE FRESHNESS OF "HASA-HASA"  
(*RASTRELLIGER BRACHYSOMUS*, BLEEKER)

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ABSTRACT

Preliminary dipping of hasa-hasa (*Rastrelliger brachysomus*, Bleeker) in a solution containing 50 parts per million of Biostat for 15 minutes was effective in prolonging the freshness of fish for 16 days. The fish preserved in Biostat ice alone were good for 11 days while those treated with ordinary ice lasted for 7 days. The fish used in this experiment were purchased from a local market center and the fish were not in a very fresh state. Effectiveness of Biostat in prolonging the freshness of fish could be accurately determined if the experiment could be conducted on fish caught right in the fishing grounds.

INTRODUCTION

In tropical countries like the Philippines where the warm climate favors the growth of spoilage bacteria, the problems of marketing highly perishable food like fish demands immediate consideration. The yearly occurrence of fish poisoning is rampant in market centers, which are far from the fishing grounds to the detriment of public consumers and the fishing industry as a whole. The City of Manila is much affected by this wave of fish poisoning, especially during the summer months when the high temperature favors bacterial spoilage.

In view of the aforementioned circumstances, the common methods of fish preservation in the Philippines are by drying and salting because they are the most economical and practical ways of inhibiting temporarily fish spoilage.

Recently, a new method of prolonging the freshness of fish was discovered by the use of small amounts of antibiotics, ranging from 1 to 100 p.p.m. based on the kind of material to be treated. In this connection, this study was conducted to determine the effect of the antibiotic (Biostat) in the preservation of fresh fish.

MATERIALS

The Biostat used in this experiment was supplied by the Belman Drug Corporation, a local

representative of an American firm, Chas. Pfizer & Co., Inc. Realizing the benefit that Biostat would lend to the Philippine fishing industry, the Bureau of Fisheries, through its Microbiology Laboratory at Dagatdagatan Research Station at Malabon, Rizal, undertook the study to determine the effect of Biostat in prolonging the freshness of hasa-hasa (*Rastrelliger brachysomus*, Bleeker).

The fish were procured from a market center in Manila, which is quite far from the fishing ground where the fish were caught.

EXPERIMENTAL METHODS

1. *Preparation of Biostat ice.* Biostat contains 85% oxytetracycline hydrochloride and to make 15 kilograms of ice it requires 0.8823 grams of Biostat X-AI (special preparation of Biostat for making ice). The mixture was transferred into a deep freezer where it was converted into Biostat ice which was used in the experiments.

2. *Preservation of Hasa-hasa* (*Rastrelliger brachysomus*, Bleeker). After washing the fish with clean potable water, the fish were dipped for 15 minutes in a solution containing 50 parts per million of Biostat GP, after which the fish were transferred to sterilized wooden boxes containing layers of crushed Biostat ice sufficient for the duration of the experiment.

3. *Preserving the fish with Biostat ice alone.* A second batch of fish was directly transferred into another box without prior dipping into Biostat and then covered with Biostat ice.

4. *Preserving the fish with ordinary ice.* The third batch of fish was packed in a box and covered with ordinary ice to serve as control.

All the three experimental batches of fish were stored with the corresponding methods of treatment and periodic observations were made on the physical changes and bacterial content of the fish.

5. *Bacterial colony count.* To determine the extent of bacterial spoilage in these batches of fish, colony counts were determined at intervals of four (4) days.

#### TECHNICAL PROCEDURE USED IN TOTAL BACTERIAL COUNT

The analysis for total bacterial count consists of enumerating the organisms or group of organisms capable of forming colonies produced by the different dilutions of samples grown in nutrient agar medium incubated at 37°C for 3 to 4 days.

The plates which contained 30 to 300 evenly distributed colonies were selected. All the colonies were counted with the aid of the Quebec colony counter.

The total count was estimated by multiplying the average number of colonies by the factor 63, which represents the area of the petri dish.

This is then multiplied by the dilution factor to determine the number of micro-organisms present in the sample.

#### RESULTS AND DISCUSSION

The experiment revealed that the Biostat is quite effective in prolonging the freshness of hasa-hasa by inhibiting the growth of micro-organisms which are responsible for the spoilage of fish.

Table 2 reveals that preliminary dipping of the fish in a solution containing 50 parts per million of Biostat enhanced further the effectiveness of the antibiotic in prolonging the freshness of fish to 16 days. Those preserved with Biostat ice alone lasted for 11 days while the control group which was treated with ordinary ice lasted for 7 days only.

Although the fish used in this study were brought several days after capture, the effect of Biostat to prolong their preservation is significant. In this connection, a much better method of determining the efficacy of Biostat to prolong the freshness of fish could be done by conducting the experiment right in the fishing grounds so that the Biostat treatment may be applied with newly captured fresh fish.

Tables I and II show that the initial bacterial count of the fish was already high indicating that there was already bacterial action when the experiment was conducted. It is evident, however, that the Biostat was able to lower the bacterial count in the few succeeding days.

TABLE I

*Fish Iced Without Dipping in Biostat Solution*

Days in ice	Biostat in Ice ppm	Micro-organisms per Gram	Observation
Initial Reading	—	1,286,500	Eyes bright, gills red, flesh firm, taste good.
2	0	163,000	Eyes dull, gills a little pale, flesh, firm, taste good.
	5	126,000	Eyes bright, gills red, flesh firm, taste good.
7	0	TNTC	Fish stale.
	5	622,000	Eyes dull, gills pale, flesh firm, taste good.
11	0	14,858,000	Fish stale.
	5	2,159,000	Eyes dull, gills pale, flesh a little soft, taste flat.
14	0	57,150,000	Stale.
	5	6,985,000	Fish showed signs of putrefaction.

TABLE II

*Fish Dipped in 5% P.P.M. Biostat Gp Before Storage*

Days in ice	Biostat in ice ppm	Micro-organisms per Gram	Observation
Initial Reading	—	946,150	Eyes bright, gills red; flesh firm, taste good.
1	0	946,150	Eyes bright, gills turned a little pale, flesh firm, taste good.
	5	334,805	Eyes bright, gills red, flesh firm, taste good.
2	0	480,050	Eyes dull, gills pale, flesh firm, taste good.
	5	228,000	Eyes bright, gills red, flesh firm, taste good.
6	0	385,750	Fish showed signs of putrefaction.
	5	234,250	Eyes bright, gills pale, flesh firm, taste good.
9	0	1,900,950	Fish putrid.
	5	85,000	Eyes dull, gills pale, flesh firm.
13	0	8,255,000	Fish putrid.
	5	357,505	Taste flat.
16	0	TNTC	Putrid.
	5	1,236,500	Taste flat.
19	5	TNTC	Showed signs of deterioration

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