

# FOOD HABITS OF BLUE AND CHANNEL CATFISH COLLECTED FROM A BRACKISH-WATER HABITAT

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THE IMPORTANCE OF ESTUARIES along the northern Gulf of Mexico is fast becoming apparent to an ever-increasing population. An estuary usually provides a complex environment composed of salt, brackish, and fresh water, with unstable boundaries subject to rapid changes in temperature, salinity, currents, and water levels. The waters of an estuary are among the most fertile in the world and consequently support a tremendous tonnage of fish and other aquatic animals.

South Louisiana's estuaries are known for their high populations of blue catfish (*Ictalurus furcatus*) and channel catfish (*I. punctatus*). Both species are common in waters yielding such marine animals as the crab (*Callinectes sapidus*), shrimp (*Penaeus* sp.), sheepshead (*Archosargus probatocephalus*), sand seatrout (*Cynoscion arenarius*), red drum (*Sciaenops ocellata*), and southern flounder (*Paralichthys lethostigma*).

Distributional data from another study (Perry, in press) indicated that a ratio of 2:1 existed between blue and channel catfish in brackish waters of the Rockefeller Wildlife Refuge. Both species were collected from waters with salinities ranging to 11.4 parts per thousand (p.p.t.).

This study was made while the author was a graduate student working with the Louisiana Cooperative Fishery Unit, a cooperative program of the Louisiana State University, Louisiana Wild Life and Fisheries Commission, and the Bureau of Sport Fisheries and Wildlife.

Widespread interest in the blue and channel catfish, along with the scarcity of published ecological information about them in estuaries, prompted the author to begin this study of their food habits.

## Materials and Methods

Sample stations were established on the Rockefeller Wildlife Refuge in tidal bayous and canals from the Gulf of Mexico to Grand Lake, a large fresh-water lake. This complex is composed of both natural bayous and constructed canals. Water in the study area was brackish; the salinities ranged from 0.18 to 35.0 p.p.t. The bottoms sampled were high in organic matter and free of rooted vegetation.

Research for this study was begun with the establishment of nine sampling stations on March 11, 1965, and terminated on February 26, 1966. Stomachs of 59 blue and 40 channel catfish were taken by trawl, trammel nets, and trot lines and preserved in a formaldehyde solution or frozen for examination later.

Laboratory food analyses were made as in the following procedure: Stomach contents were sorted and identified, percentage volume of each food item was determined by volumetric displacement, and percentage frequency of occurrence was determined. Intestinal contents were also examined when available.

Summarized results of the food study were recorded by the size ranges which approximated the age groups of an earlier study.

## Results and Discussion

Blue Catfish.--In the blue catfish of the smallest size group (95 to 187 millimeters), small invertebrates--including amphipods, shrimp, insects, and undetermined organic material--made up the major part of the stomach volume (table 1). Amphipods and insects were barely represented in stomachs of larger fish. Use of shrimp, crabs, and fish increased in the intermediate size groups and reached a maximum in the 465- to 722-millimeter blue catfish. It is probable that the percentage of vegetation is somewhat exaggerated in this series of analyses because of the limited number of larger fish.

Blue catfish as small as 95 millimeters contained fish remains, though the

transition from small invertebrates to fish and macroinvertebrates seemed to occur when the catfish were 293 millimeters in total length (table 2). In general, this agrees with the findings of Brown and Dendy (1961), who concluded, after analyzing 152 blue catfish from Alabama rivers, that the transition from invertebrates to fish as the major source of food occurred while the catfish were 203 to 330 millimeters in total length. Darnell (1958) after analyzing 78 stomachs, concluded that until blue catfish in Lake Pontchartrain, Louisiana, reached a size of 100 millimeters, they fed chiefly upon zooplankton. A stage that was dependent upon small bottom-inhabiting invertebrates was prominent in the 100- to 240-millimeter catfish, though fish appeared frequently

TABLE 1.--Occurrence of food items in digestive tracts of 59 blue catfish

[F = frequency of occurrence; P = percent volume]

Food items	Size range (millimeters) <sup>1</sup>									
	95-187		188-292		293-393		394-464		465-722	
	F	P	F	P	F	P	F	P	F	P
Crustacea:										
Amphipoda-----	8.00	7.41	5.20	1.57	-----	-----	-----	-----	-----	-----
Penaeus sp.-----	24.00	2.15	8.00	30.94	28.50	11.01	25.00	3.07	25.00	28.27
Callinectes sap- idus-----	-----	-----	21.00	16.28	-----	-----	25.00	3.96	50.00	15.46
Insecta:										
Diptera-----	12.00	3.90	5.20	.05	-----	-----	-----	-----	-----	-----
Vertebrata:										
Anchoa mitchilli---	-----	-----	-----	-----	28.50	8.78	-----	-----	-----	-----
Cynoscion arena- rius-----	-----	-----	-----	-----	14.20	3.96	-----	-----	-----	-----
Mollienesia lati- pinna-----	-----	-----	-----	-----	14.20	.52	-----	-----	-----	-----
Mugil sp.-----	-----	-----	8.00	.57	14.20	13.76	-----	-----	-----	-----
Ictalurus sp.-----	-----	-----	-----	-----	14.20	.17	-----	-----	-----	-----
Fish remains-----	20.00	14.50	5.20	26.17	14.20	1.20	50.00	2.97	50.00	18.11
Algae, filamentous---	52.00	27.10	42.00	18.48	14.20	.03	-----	-----	25.00	28.49
Vascular plants-----	48.00	5.40	42.00	1.26	14.20	.02	-----	-----	50.00	9.67
Organic material (un- determined)-----	36.00	75.00	21.00	3.20	42.80	58.50	-----	-----	-----	-----
Sand and silt-----	20.00	.42	5.20	.05	14.20	1.72	-----	-----	-----	-----
Number examined-----	25	-----	19	-----	7	-----	4	-----	4	-----
Number with food-----	24	-----	16	-----	5	-----	3	-----	4	-----

<sup>1</sup> Size ranges of approximate calculated age groups.

