

STUDIES OF SALMONELLAE POTENTIAL IN CATFISH FEEDS

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Eighteen samples of catfish feeds used in U.S. Southeast, which included 14 brand names, have been analyzed by standard bacteriological methods for the presence of salmonellae.

Each of 18 samples taken from 50-pound bags was divided into six 50-gm portions for inoculation into tetrathionate broth. After 24 hours, the broth was streaked on Bismuth Sulfite agar and Salmonella-Shigella agar. A considerable number of large mucoid swarming colonies were noted on the Salmonella-Shigella agar, but scanty growth was noted on the Bismuth Sulfite agar. Most of the large mucoid colonies appeared to be *Proteus* on further culture.

Not true salmonellae could be confirmed on further selective media culture and by serological methods.

Although a limited number of samples were examined, it appears that catfish feeds are relatively free from salmonellae.

Farm-raised channel catfish (*Ictalurus punctatus*) are fed a pelletized feed composed in part of meat meal and fish meal to supply the necessary animal protein. In the past, meat meal and fish meal have been implicated in the epidemiology of outbreaks of *Salmonella* dysentery. Much progress has been made in the sanitation and processing techniques of these meals. The potential, however, exists for further outbreaks.

We decided it would be valuable to the commercial pond-raised catfish industry to determine the potential for *Salmonellae* in the dressed fish from pelletized feeds. Eighteen samples, composed of six 50-gm portions, were obtained from 14 different brand names. The samples were obtained by aseptic techniques from 50-pound bags. Two

bags were infested with small beetles, and these insects caused the samples to be contaminated from an outside source.

METHODS

The six 50 gm portions were added to 500 ml flasks containing 300 ml of tetrathionate enrichment broth and incubated overnight. Cultures from the tetrathionate were streaked on *Salmonella*-*Shigella* agar and on Bismuth Sulphite plates. These plates were incubated 24 hours and any suspicious colonies were inoculated on Triple Sugar Iron slants. Slants showing typical *Salmonellae* reactions were transferred to Urea broth and *Salmonella*-*Shigella* plates. The few positive results from these media were tested by serological methods.

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RESULTS

From the 108 50-gm portions, no positive serological tests were found for Salmonellae. It was noted, however, that considerable "spreading colonies" occurred on the Salmonella-Shigella plates. This was especially notable in those samples containing insects when the entire plate was covered by the "spreader." These "spreaders" gave the typical presumptive tests for Proteus in Urea broth and on the Triple Sugar Iron slants.

CONCLUSIONS

It is not known at this time what effect large numbers of Proteus might have on the

keeping quality of fresh dressed iced catfish. Proteus is a hydrogen-sulphide former in most situations. The pond-raised catfish industry is troubled with "off" odors in the live fish, and these odors are carried over to the dressed fish even in the most sanitary conditions.

It has been learned that pelletized catfish feed is often formed by a hot extrusion method in order to obtain the necessary dryness for slow sinking or floating feeds. It appears from this brief study that Salmonellae from commercial catfish feeds will not be a problem in that industry. Further studies already are underway on the musty odor problem at other laboratories.



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