

Sanitation Guidelines for the Breaded-Shrimp Industry



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES

Circular 308

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ABSTRACT

Physical plant requirements, cleaning procedures, operating procedures, and need for personal hygiene are discussed.

INTRODUCTION

The ever-increasing application of technology by the food-processing industry makes the sanitation measures used some years ago inadequate. As processing becomes more complex and sophisticated, so do the sanitation problems. Large numbers of workers standing along the processing lines handle the product. If any one of them is guilty of the slightest hygienic malpractice, he may contaminate the product and thereby affect the health of hundreds of consumers.

The solution lies in rigid control of plant sanitation. Sanitation-control measures are not merely cleaning procedures--they involve all the procedures that ensure that a finished product reach the consumer in the best possible condition. The guidelines presented here were prepared to help the breaded-shrimp industry achieve this goal.

PHYSICAL PLANT

BUILDINGS

The foundation of a sanitation program for any industry necessarily begins with a discussion of the physical plant. Regardless of the excellence of the starting raw material the final product invariably reflects the hygienic conditions under which it was processed. The design, layout, and construction of the physical plant play an important role in assuring the production of a safe, clean, and wholesome product. The reader should not think of the physical plant in a limited context confined merely to the construction of plant buildings. Rather, it is suggested that the physical plant be defined as all structural components germane to the processing operation. Such a definition would include not only the building, but also other facilities such as plumbing, waste disposal systems, water supply, storage areas, and processing and refrigeration equipment.

The plant buildings must be soundly constructed and always in good repair. All outside openings should be adequately screened to prevent the entrance of flies, birds, rodents, and other pests. All screen doors should be self-closing and operable. In addition to



Figure 1.--Modern plant building.

being screened, large doors, such as those routinely installed at loading docks, should be protected by such devices as fly fans. Double-entry doors should be used at all entryways into processing areas.

Despite all of these measures, however, insects will find a way to get in, so mechanical devices, such as traps or pesticides, should be used.

When they are used, extra care should be taken to ensure that traps do not hang directly above food products or processing tables and that drift of the pesticide can in no way contaminate the product. The safest way to eliminate all possibility that a pesticide will contaminate the product is to avoid its use in all food-product zones. The pesticide itself must be one that has been approved by the U.S. Department of Agriculture for use in food-processing plants.

FLOORS, WALLS, AND CEILINGS

All floors should be of a hard, impervious material that tends to remain free of cracks and any other roughness that would interfere with proper cleaning. The floors should slope toward suitable rodent-proof drains so that the water will drain after the floors are washed down.

The walls, ceilings, partitions, posts, doors, and other integral parts of all buildings should be of such materials, construction, and finish so that they can be washed efficiently and thoroughly.

WATER, PLUMBING, AND OTHER FACILITIES

Water should be easily accessible, under sufficient pressure for adequate cleaning, and from a source approved by the State health authorities. All private water systems must be constructed and operated in accordance with the recommendations contained in Public Health Reports, Reprint No. 24, "Individual Water Supply Systems" (Available from U.S. Public Health Service, Bethesda Office Center, Rm. 26, Bethesda, Md. 20014).

Plumbing must be installed in compliance with State and local ordinances, or, in the absence of such ordinances, it must meet or exceed the standards recommended in the American Standard National Plumbing Code, ASA-A40.85 1955 (Available from United States of America Standards Institute, 10 E. 40th St., New York, N.Y. 10016). Lavatories with hot and cold water should be located so that plant personnel can readily use them. At each of these lavatories, a nail brush should be provided; the brush should be

suspended by a chain of a length that prevents its touching the wash basin.

The number and adequacy of water closets must conform to the specifications set forth in the 1965 National Shellfish Sanitation Manual of Operations, Part III (Available from U.S. Public Health Service, Bethesda Office Center, Rm. 26, Bethesda, Md. 20014).

Toilet rooms and lavatories should have signs that direct employees to wash their hands before returning to their work stations. Hand-sanitizing stations, containing rinse solution of 50 p.p.m. (parts per million) available chlorine, or some other effective sanitizer, should be located at each hand-washing facility and in other areas near work stations throughout the plant.

The working rooms should be adequately ventilated, heated, and lighted. The light provided--natural, artificial, or both--should be ample for the use to which the particular portion of the building is devoted.

WASTE-DISPOSAL SYSTEM

Owing to the complexities and disparities of such factors as plant size, production, and dehydrating reduction capabilities, it is impracticable to set forth specific guides on waste-disposal systems to be followed by all. Ideally, all plant sewage should be discharged into public sewers. When the discharge of plant waste into public sewers is not feasible and private systems must be relied upon, these private systems must be constructed according to State and local regulations. Any waste-disposal system must be constructed and maintained so that the waste will be inaccessible to flies and rodents. Disposal of solid wastes should be carried out on a regular and frequently scheduled basis.

DRY-STORAGE AREA

Dry materials such as breadding, batter mix, and packaging must be stored in a separate room that cannot be used as an entryway to other areas of the plant. This room must be constructed so that it does not receive floor-drainage water from other parts of the plant. All materials in the area should be stowed on pallets.

All poisonous and toxic materials (cleaning compounds, disinfecting compounds, and pesticides) must be stored in a separate room designated for this purpose. These materials must be prominently and distinctly labeled so that there can be no confusion between these and the edible materials used in the plant.



Figure 2.--Properly stored breeding material. Trade names mentioned do not imply endorsement of commercial products.

PROCESSING EQUIPMENT

All utensils and other equipment in the food-contact zone should be of smooth, impervious, corrosion resistant, nontoxic material that will not readily disintegrate or crack. They must have no exposed screws, bolts, or rivet heads around which food material can accumulate. For this reason, all joints must be welded, bonded,



Figure 3.--Automatic peeling equipment.

or soldered flush so that all surfaces are smooth. In addition, all surfaces should be so drained that water will flow off naturally.

All belts, flumes, and other conveying devices should be designed to prevent the product from stopping on its way through the



Figure 4.--Automatic peeling equipment.

processing areas. Heavy, fixed equipment should be installed so that it is readily accessible for cleaning.

Chains or chain-drives should never be exposed in the food zone. They must be covered not only to protect personnel but also to prevent the product from being contaminated with lubricating material.

REFRIGERATION AND FREEZING EQUIPMENT

Ice used for the refrigeration of shrimp must at all times conform to standards established by the U.S. Public Health Service for ice and public drinking water. Plants that make their own ice should manufacture and store it in a sanitary fashion. Refrigeration equipment must be adequate for freezing the day's production as it is processed. As a rule of thumb, a bulk package containing 5 or more pounds should be hard-frozen within 24 hours; a smaller package, within 12 hours.

CLEANING

The next broad area for attention is cleaning the physical plant. The following discussion of cleaning includes both general and in-place techniques for the physical plant as well as specific suggestions for utensil cleaning.

GENERAL CLEANING

The premises should be kept clean and free of litter and rubbish. Unused equipment should be stored away from the processing areas. Animals should never be allowed in the plant; only authorized persons should be admitted to the processing areas. During the processing, any food debris accumulating on machinery must be removed promptly.

IN-PLACE CLEANING

The methods used to clean food-processing equipment and food-plant premises vary considerably; however, most satisfactory cleaning includes the following steps:

1. A wholesale flushing with water to remove extraneous material.
2. A thorough scrubbing with water and suitable detergent.
3. A rinsing with hot water (at not less than 170° F.).
4. A sanitizing rinse with chlorinated water (containing 200 p.p.m. available chlorine).

All equipment on the processing lines (except that containing dry material, such as breadings) should be cleaned at least twice a shift--once during the meal break and once immediately after processing has stopped. At the onset of processing, all equipment



Figure 5.--Cleaning of breading equipment.

that will come in contact with the product must be rinsed with potable water to which not less than 200 p.p.m. available chlorine has been added. All chill tanks should be drained, cleaned, and sanitized at least twice during each shift.

CLEANING OF UTENSILS

All utensils should be cleaned according to the following procedure, or its equivalent:

1. Rinse with water.
2. Thoroughly scrub in hot water (at least 170^o F.) containing a suitable detergent.
3. Rinse with hot water (at least 170^o F.).
4. Immerse for 2 minutes or more in potable water to which not less than 50 p.p.m. available chlorine has been added.

After being cleaned, all utensils should be stored so they will not be recontaminated. Immediately before being used, all utensils that will come in contact with the food product must again be dipped in water containing not less than 50 p.p.m. available chlorine.

CLEANING OF FLOORS

All floors should be kept free of debris and slime at all times; piling waste on floors should be prohibited. The floors should be scrubbed with hot water (at least 170° F.) containing a suitable detergent and rinsed with clean water containing not less than 200 p.p.m. available chlorine.

OPERATING PROCEDURES

The operating areas of a typical breaded-shrimp plant may be divided into five broad categories: receiving and thawing, grading, peeling and deveining, breading, and packing. Operating procedures for managing the work in these areas and for administering personnel who do the work should be clearly specified. The following section contains matters that should be included.

RECEIVING AND THAWING AREA

As soon as the chilled raw product reaches the plant, it should be iced so that its internal temperature will not exceed 40° F. before it is processed. The raw shrimp should be placed in a "green headless" tank, where it can be separated from the ice and washed.



Figure 6.--Spray wash device.

A series of low-velocity sprays discharging nonrecirculating potable water over the exit conveyor leading from the tank will give the shrimp the thorough washing they must have.

Blocks of frozen raw shrimp should be thawed either by being rinsed with potable water or by being immersed in a tank of potable water. If a tank is used, sprays should be installed over the exit conveyor to provide for a vigorous wash. The water used for thawing should never come in contact with the packaging material that covers the frozen product, because this would contaminate the product with whatever happens to be on the container.

GRADING AREA

After being graded, those shrimp that are not to be immediately processed should be iced so their internal temperature will not exceed 40° F. If a holding tank is used in the grading area, sprays should be mounted over the exit conveyor so that the shrimp can be washed again. All baskets, boxes, and other collection containers in this area should be kept on pallets, both in use and in storage.

PEELING AND DEVEINING AREA

When the shrimp reaches the peeling and deveining area, it should be iced so that its internal temperature does not rise above 50° F. All edible portions of meat picked during the peeling should be promptly flumed to a metal skimmer for further inspection or placed in a nonporous collection container. Collection containers must be sanitized before each use by being soaked for 2 minutes in a solution of potable water containing 50 p.p.m. available chlorine. After the peeling and deveining, the meat selected for further processing should be chilled to a temperature of not more than 40° F.--immersion in a tank of ice water or any other procedure giving similar results is acceptable.

When shrimp pieces are not to be further processed immediately they must be iced by the layering method until such time as they are packaged and frozen. The delay between deveining and icing should be minimal.

BREADING AREA

Except for those layout lines where shrimp are predusted, a series of low-velocity sprays should be installed over the line to wash the shrimp just before they enter the batter machine.

The temperature of the batter should be controlled so that it never exceeds 50° F. All unused batter must be disposed of at the meal break and when operations are ended each day.

When batter or breading is packaged in multiwalled bags, the outer bag must be removed before the batter or breading is emptied into batter machines, breading machines, or storage bins. Breading material remaining in breading equipment is to be disposed of at the end of each day.

PACKING AREA

The packing area must be large enough to permit handling the product in a sanitary manner; all equipment in this area must be kept neat and clean. No more than 30 minutes should elapse from the time the product is enclosed in a container until it is placed in a freezer.

PLANT PERSONNEL

There are certain guidelines for employees and supervisors in the shrimp breading plants. These guidelines concern health, dress, and habits of the employees and the responsibilities of the supervisors.

HEALTH

All food-handling personnel must possess a current health certificate, which should be renewed as often as local health authorities require. No person who is known to have or is thought to have a communicable disease; no person who is known to be or is thought to be a carrier of such disease; and no person who is known to have or is thought to have such disease in his home may be employed or permitted to enter the plant. Every employee, when requested, must furnish the information, permit the physical examinations, and submit the laboratory specimens required by public health authorities to determine whether he has a communicable disease. Employees with sores or lesions on their hands or faces must never be allowed to handle food or utensils that come in contact with the food product.

DRESS

All employees must wear clean outer garments, preferably white, that cover the employees' personal clothing. Also, they must wear caps that cover their hair. In hot weather, hairnets

may be substituted for the caps, but they must effectively cover and hold the hair in place. Hand jewelry--such as rings, bracelets, or watches--should never be worn by food handlers during the processing operations.

Lockers for storing employees' street clothing must be placed outside the processing area. Soiled clothing or hand protectors must not be stored in these lockers; rather, they must be placed in specific covered containers provided for soiled articles.

HABITS

Plant personnel must not eat, drink, or use tobacco in any form in the processing areas, nor should they use cloth towels in these areas.

The individual employee makes or breaks any sanitation program. The employee's recognition of the need for and his participation in the observance of good, sound sanitary procedures is the most important single factor in the job of preparing safe, wholesome food products.

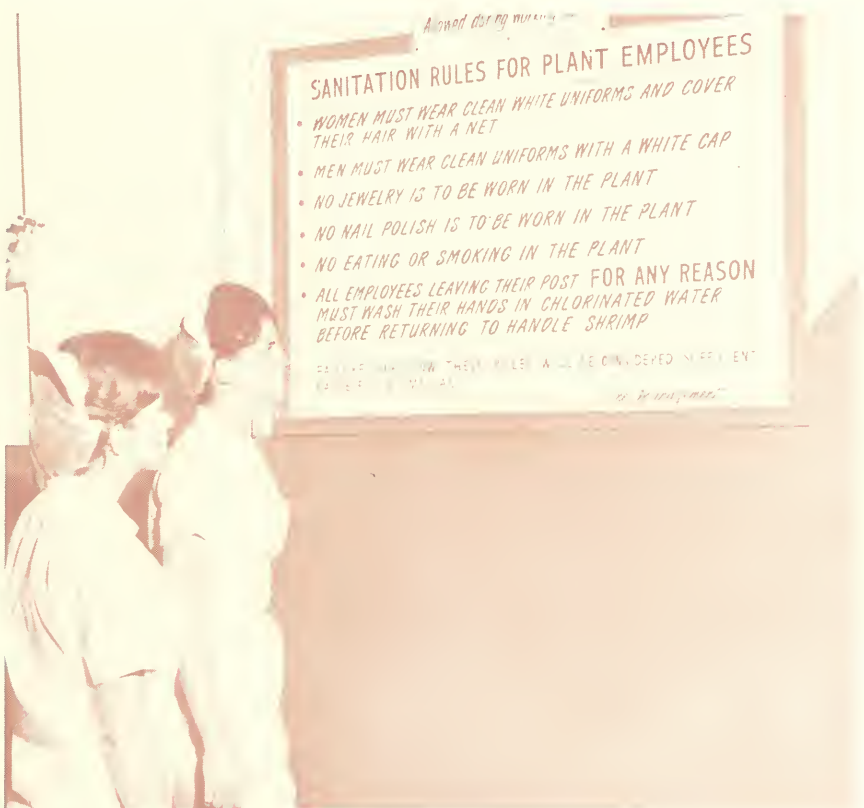


Figure 7.--Employee training program.

SUPERVISION

The management must designate a reliable individual who will be responsible for carrying out these guidelines. This individual should get all employees interested in good sanitary practices. Training sessions, with films or other audio-visual aids, may be used to explain the importance of proper sanitation procedures. The supervisor must watch carefully the health of the employees. Any who appear to be sick should not be allowed to work.

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