

MEAT RESEARCH NEWS LETTER

CSIRO

DIVISION OF FOOD PRESERVATION,
MEAT RESEARCH LABORATORY,



NUMBER 70/4

DATE 29th April, 1970

P.O. BOX 12 (CNR. CREEK AND WYNUM ROADS), CANNON HILL, BRISBANE, QLD 4170 TELEPHONE 95 4006 TELEGRAMS FOODPRES BRISBANE

CLEANING AND SANITATION

All meat operations have at some time suffered losses of product through microbial spoilage. These losses can be total, in that the product has to be destroyed, or partial, in the acceptance of a reduced price or in reprocessing to an item of lesser value. These losses can be avoided or minimised by careful hygiene control of the handling and storage conditions, and by careful control of the storage times and temperatures (see News Letter 69/1).

There is an increasing emphasis on the bacteriological status of meat and meat products and a strong possibility of both governmental and private microbiological standards and guidelines being implemented. Because of this it is time managements examined their responsibilities in this area and reviewed their cleaning objectives.

Proper cleaning methods produce sanitary conditions which are a good investment resulting in:

- Extended storage life of both raw and processed meats,
- Production of conditions allowing inspections without risk of suspension on sanitation grounds, and of a product capable of meeting private and governmental microbiological specifications,
- Reduction in the risk of product being involved in outbreaks of food poisoning,
- Fewer product rejections, returns or complaints,
- Less need to reprocess product,
- Reduction in maintenance costs and time lost through breakdowns.

The control of the microbial populations on floors, walls, equipment and in the air needs the intelligent use of an appropriate cleaning programme.

WHAT IS A CLEANING PROGRAMME?

A cleaning programme is a planned schedule of how, when and where cleaning will be done. The schedule should include written instructions giving details of the frequency, the method, the strength and type of detergent to be used and any variations (e.g. acid detergents should be used at times), how to dismantle the equipment for cleaning, the sanitizing agent to be used, its strength and method of application, and variations in the type of sanitizer.

The cleaning programme should be under the control of a trained supervisor and copies of the schedule should be available to him and all key personnel. The necessary equipment should be readily available to the people performing the work. Careful control should be kept on the use of detergents and sanitizers - they should be purchased in bulk and distributed in smaller quantities to convenient locations throughout the plant.

If the current programme or system does not result in satisfactorily cleaned surfaces then a reassessment is needed - it could be that the procedures used in cleaning do not allow the detergent to perform its task or an alternative detergent material is needed.

The cleaning of a plant is expensive in terms of labour, water, steam and detergents and because of this it is important that it be closely supervised. The value of a correctly functioning cleaning programme cannot be over emphasized and managements should ensure that good supervisors and labour are available for this task, that the cleaning staff understands its functions and responsibilities, and that the methods of cleaning used are satisfactory.

SUGGESTED METHOD OF CLEANING

In reply to the question "How do you clean your plant?", all too often the reply is "With a hot water hose and water at 180°F.". Experience has shown that this method of cleaning does not achieve the desired result, and the microbial populations on surfaces treated this way are often excessively large. A suggested method of cleaning, found to give successful results, is listed below:

(1) Dry Clean the entire area. Sweep, pick up dropped meat and other material, and remove this to waste areas or bins. Scrape the fat from the surface of cutting boards, belts etc. and put the scraps in rendering bins.

Remove all plastic and other packaging material from the area. All moveable equipment (cutting boards, containers, etc.) should be taken away to be cleaned and treated as separate articles.

(2) Wet all equipment. Hose with low pressure water at a temperature less than 110°F. The purpose of this operation is to soften blood residues (if blood is hosed with hot water it is difficult to remove).

(3) Apply a suitable detergent. It is essential to use a suitable detergent to clean satisfactorily. The nature of meat residues to be removed makes it desirable to use mildly to highly alkaline detergents. Care should be exercised in the choice of detergents since some can cause corrosion of construction materials e.g. Aluminium, galvanizing. The method of application of detergent is variable. Where large areas are to be cleaned, the possibility of using foam cleaning should be examined. A sufficient time for the detergent to act must be allowed. Some mechanical action (e.g. scrubbing) may help considerably to speed this action. Temperature has an effect on detergents: efficiency increases with increasing temperature, but above 140°F the benefits are small and some detergents work effectively at lower temperatures.

(4) Rinse off Detergent. It is essential that the detergent and the residual material loosened by it be thoroughly rinsed off the surface. Failure to rinse sufficiently will allow a film to accumulate on the surfaces. Warm water at about 110°F is recommended although cooler water may be adequate.

(5) Apply a Sanitizer to All Surfaces. A sanitizer is a chemical which kills microorganisms. It can be used either combined with a detergent in step (3) or separately on the clean surfaces after rinsing off the detergent. As a separate operation it can be applied by spraying, flooding or by fogging the entire room. Acceptable materials used include chlorine (e.g. Sodium hypochlorite), quaternary ammonium compounds, iodophors, and complex phenolics. It is essential to allow at least 10 minutes for action of the sanitizer, which can be left on surfaces overnight.

(6) Hot Water Rinse. Rinse all surfaces with hot water at 180°F after the completion of sanitation or, if sanitizer is left in contact overnight, rinse contact surfaces before the commencement of work. This is important since there is a risk of taint by residues of some sanitizing materials.

No free water should be left on or in equipment or floors overnight. Equipment and floors should be self-draining.

Removeable equipment (cutting boards, trays etc.) is treated slightly differently:

- (1) Dry clean.
- (2) Hose with warm water.

- (3) Immerse individually in hot water (130° - 140°F) containing a detergent or detergent-sanitizer. After soaking for 20 minutes, scrub all surfaces and rinse with clean warm water.
- (4) If only a detergent is used in Step (3), then soak in a sanitizing solution for 20 minutes. Rinse with water (180°F).
- (5) Place each item in such a position that the surfaces are not touching - allow to air-dry. Do not stack polythene cutting boards on top of one another.

Polythene cutting boards can be significant sources of spoilage organisms when inadequately cleaned. Because of the nature of the scored surface they are difficult to clean and should be resurfaced every 2 - 3 weeks using a belt-sander. There is also a tendency for cutting boards to be physically too large to handle properly so their size should be kept to a minimum.

Excessive use of hot water in the areas to be cleaned can result in condensation forming on the overhead gear, ceilings, ductwork etc. The condensate falls on to the surface of equipment and product and depending on the cleanliness of the overhead gear can result in a clean surface becoming very dirty. It is necessary, therefore, for overhead areas to be cleaned on a regular basis to avoid contamination from this source.

The design of equipment and the materials used in its construction should facilitate cleaning. This is an important factor to consider in the purchase of equipment.

HOW CLEAN IS CLEAN?

It is essential that every surface touched by the product should be visually free of food particles, be free of chemical residues, and not have excessive microbial populations. A commercially-clean surface will not be sterile, but the number of organisms on a product contact surface should be much less than the number on the product passing over it. The surfaces should not add significant numbers of spoilage organisms to the product passing over it, and the total environment should not have any food poisoning organisms present.

All contact surfaces should be clean before meat is placed on them, but there will be an equilibration of the numbers between the surface and the meat so that after a period the work surface will carry a population determined by the numbers on the product passing over it, and any growth that occurs on the surface. Therefore, the process of cleaning and sanitation is to ensure that the "cleaned" work surface does not add organisms to an otherwise satisfactory product.

There are several tests which can be used to see if a surface is clean and these are:

- General appearance - Contamination or oxidation should not be visible under good lighting conditions. Particles of meat should not be present in the cleaned room.
- The work surfaces should not feel greasy or rough when rubbed with the fingers.
- A clean white tissue should not be discoloured when rubbed over the surface of cleaned stainless steel - this is not applicable to aluminium or galvanized material.
- No objectionable odour should be detected.
- All surfaces should be dry before work as a result of cleaning operations the previous night.
- When a cleaned surface is wetted, the surface should not show signs of excessive water breaks while water is passing over the surface.
- After cleaning and sanitizing, the work surfaces should have microbial populations below a maximum value, the value depending upon the product, its stage in processing and expected storage life.

The first six tests are quickly performed and can be done on a daily basis by a trained Quality Control Officer as a portion of the routine housekeeping inspection.

Since bacteria cannot be seen by the eye, visual inspections give little indication of the microbiological status of the surfaces. Therefore, some technique for checking the level of contamination is necessary. The techniques used are simple, and the necessary equipment is not expensive. Quality Control Officers can be taught these simple routines, and can then check the adequacy of cleaning and sanitation on a regular basis. The visual and microbiological inspections can assure that the methods of cleaning employed by your Organisation are effective.

Sanitation has been described as good housekeeping desired by management:-

Have you a cleaning program for your plant?

Is it adequate for your needs?

Do you receive regular reports that the program is being carried out thoroughly?

Is the standard of housekeeping in your plant equal to the standard in your home and to the standards expected by your customers?

If you answer "YES" to all the above questions, you should ask for a raise in your salary!

-----oooooooooooooooooooooooo-----

NEWS JOTTINGS:

The subject of detergents, foams and foam guns is being investigated and a report will be made to industry later this year.

Supplies of a range of prepared medias and pre-poured petri dishes for use in bacteriological testing of equipment and meat can be obtained from: Bacto Laboratories Pty. Ltd., 18 a Moore Street, Liverpool, N.S.W., 2170, and Bio-Science Laboratories Pty. Ltd., P.O. Box 113, Glenroy, Victoria, 3046.

In May, 1970, the Hawkesbury Agricultural College is holding a Quality Control course sponsored by the Australian Meat Board. This course will include an introduction to microbiological quality control. If successful, it is hoped to hold another school later in the year.

Buffalo Meat: Taste panel tests on domesticated and rested wild Northern Territory Buffalo 1½ to 5½ years old showed that the fillet (tenderloin) was rated as tender, of a tenderness comparable to that of cattle, but striploins were considered tough.

NEXT NEWS LETTER:

The next News Letter will be:

Spoilage of Fresh Carcasses - The Effect of Surface Drying.