Page C. Inspection of Cheese Making Operations. (Form DA - 151 - 3)

Milk Processing

Item C1—Room Construction (58.126, 58.407).

See the guidelines for Item A1—Room Construction.

Give special attention to overhead construction conditions which could lead to direct contamination of the milk or cheese in open vats or hoops. Check for dirty overhead fans or louvers, open cracks in the ceiling, roof leak evidence, peeling paint and condensate drippage. When such deficiencies are noted, which could allow direct contamination of the product, make applicable recommendations and stress the importance of prompt correction.

Item C2—Lighting & Ventilation (58.126d, e).

See the guidelines for Item A2—Lighting & Ventilation.

Item C3—Pumps, Pipelines, & Valves (58.128, 58.146a).

See the guidelines for Items A3—Pumps, Pipelines, & Valves.

Item C4—Clarifier or Separator (58.128a, e).

See the guidelines for Item B4—Separator.

Inspection of clarifiers is basically the same as for separators. The sludge from self-cleaning clarifiers and separators is sometimes flushed away with water into the plant's floor drain system. At other plants, the sludge may be stored separately for disposal with plant garbage or for animal feed. In such instances, check that the sludge is handled in clean, covered containers in a satisfactory manner prior to disposal. In no case shall the sludge from clarifiers be directed back into edible product.

Item C5—HTST Sealed _____ at _____ sec. _____° F (58.128, 58.438, 58.439).

See the guidelines for Item B5—HTST Sealed _____ at _____ sec. _____° F.

Some cheeses are made from raw or heat-treated milk. However, when the plant produces any cheese that is required to be made from pasteurized milk by a standard of identity, or any cheese that is marked as pasteurized, the HTST pasteurizer shall comply with the *3-A Accepted Practices for the Sanitary Construction, Installation, Testing, and Operation of High—Temperature Short—Time Pasteurizers, Number 603-* . If the proper controls and equipment are not present to comply with the 3-A Accepted Practices, show a recommendation on the report such as:

C5. — "If the cheese is to be marked, 'Made from Pasteurized Milk', equipment and controls shall be installed to meet the 3-A Accepted Practices for HTST Pasteurizers, Number 603- . This survey shows that {fill in names of items that are lacking} are needed." (A*****)

***** See paragraphs below for the proper category assignment

If pasteurization is required, or intended, the cheese milk shall be pasteurized at 161° F for not less than 15 seconds unless fortified to above 10% butterfat or 18% total solids, which requires a minimum of 166° F for not less than 15 seconds.

The following guidelines apply for pasteurization deficiencies noted during the survey:

A. Cheeses Defined as Made From Pasteurized Milk by an FDA Standard of Identity.

Whether or not the finished cheese is labeled as pasteurized, the plant shall utilize approved, properly engineered, and sealed pasteurization equipment for all dairy ingredients. Otherwise this shall be considered a category A deficiency (applies to Cottage, Neufchatel, Cream, Monterey or Monterey Jack, High Moisture Jack, Muenster, and all types of Mozzarella and Scamorza). Some plants may be using the phosphatase test to determine pasteurization instead of using properly engineered pasteurization equipment. This is not a recommended practice and is not acceptable at USDA approved plants. USDA approved plants that make these cheeses shall have properly engineered pasteurizers.

B. Uncured Soft Cheeses Which are Usually Consumed Fresh and for Which There is no FDA Standard of Identity.

Same policy as outlined in paragraph A above (applies to Bakers and Farmers cheeses).

C. American Type Cheese.

The procedure for preparing the survey report and assigning deficiencies to categories shall be as follows:

1. When a plant is marking any of its production of cheese as “Pasteurized” and the survey shows that proper equipment and controls are installed and sealed, the inspector shall check this item satisfactory and show the required information about HTST time, temperature, etc.

2. When a plant is marking any of its production of cheese as “Pasteurized” and proper controls or equipment <u>are not present</u>, show a recommendation for provision of a properly engineered pasteurizer system. This shall be considered a category A deficiency.

3. When a plant is marking any of its production of cheese as “Pasteurized” and raw dairy ingredients (such as whey cream) are added after the pasteurizer, recommend that all dairy ingredients be pasteurized. This shall be considered a category A deficiency.

4. When a plant is <u>not</u> marking the cheese as “Pasteurized” and is heat-treating the milk, mark this item NA and show the temperature and holding time in item C7—Heat-Treating at __ sec, __° F. Also, check the finished product for proper labeling as outlined in item C54.

   In some instances, a plant might be manufacturing American type cheese from both pasteurized and heat-treated milk, and management may wish to use the same HTST unit for processing the milk. In such case, the pasteurizer shall comply with the 3-A Accepted Practices for HTST Pasteurizers and shall have a dual diversion control system (as outlined in Item B47), with one of the divert settings to be at least 161° F and the other at a heat-treatment setting chosen by management, such as 147° F.

Although this section concerns American type cheese (Cheddar, Washed Curd, Colby, Granular) it also applies to the following cheeses which, by FDA definition, may also be made from either pasteurized or unpasteurized milk: Asiago, Blue, Brick, Caciocavallo, Edam, Gouda, Gorgonzola, Hard cheeses, Grating cheeses, Gruyere, Limburger, Nuworld, Parmesan, Provolone, Soft Ripened cheeses, Romano, Roquefort, Samsoe, Sap Sago, Semisoft cheeses, Semisoft Part-Skim cheeses, Spiced cheeses, and Swiss.

There are separate FDA standards of identity for Cheddar Cheese for manufacturing, Washed Curd Cheese for manufacturing, Colby Cheese for manufacturing, Granular Cheese for manufacturing, and Brick Cheese for manufacturing. Such cheese must conform to the respective standards for Cheddar, Washed Curd, Colby and Granular cheese, except that the milk is <u>not</u> pasteurized and curing is <u>not</u> required. This type of cheese is intended for processing or other manufacturing purposes which involve high heat treatments during the processing. Since by definition, the milk for cheese making is <u>not</u> pasteurized, do not criticize lack of a timed and sealed pasteurizer if the plant uses the option of heat-treating the milk. If the plant is making one of these types of cheese “for manufacturing,” mark this item NA and use

items C6—Heat-Treating or HTST Equipment and C7—Heat-Treating at _ sec, __ ° F to cover the situation.

D. Other cheeses.

Pasteurization in “3-A” equipment of the fluid product for making some cheeses is not required for plant approval because of high temperatures employed in the manufacturing methods for the cheese.

FDA Standards of Identity for Cook cheese (Koch kaese) and Gammelost specify how the cheese curd is heated to high temperatures during the manufacturing process (at least 180° F for Cook cheese and about 145° F for not less than ½ hour for Gammelost). Pasteurization of the fluid skim milk mixture is <u>not</u> required prior to start of cheese making. The standard of identity for Cook cheese shows a phosphatase test requirement, but this can be satisfied by the <u>curd</u> cooking treatment. Ricotta cheese (no FDA Standard of Identity) is also made by a manufacturing procedure which involves high heat and acid precipitation of proteins from whey or whey-milk mixtures. Temperatures of 170-200° F for 5-20 minutes are employed. Initial pasteurization of the dairy ingredients is not required even though the Ricotta cheese is sold fresh for consumption without curing.

If any of the cheeses in this category are labeled as “pasteurized,” and the fluid product from which the cheese is made is not pasteurized with legally sealed equipment, the inspector shall show a recommendation for provision of a properly engineered and sealed pasteurizer system (use the same wording as the example above). This shall be considered a category C deficiency.

E. Condensed Milk for Cheese Making.

Pasteurization at a minimum temperature of 161° F for at least 15 seconds or its equivalent, using legally sealed pasteurization equipment is required <u>prior to</u> the evaporator. This pasteurization step is required even if the cheese is labeled as made from raw milk.

If the condensed milk is received from another plant it shall be repasteurized or the cheese shall be labeled as “heat-treated,” “unpasteurized,” “raw milk,” or “for manufacturing” (see Item C54 for labeling requirements of raw milk or heat-treated milk cheese). The condensed product shall be pasteurized, separately or by blending the reconstituted product with fresh milk in the constant level tank of the HTST, at a minimum of 161° F for a minimum of 15 seconds. However, a pasteurization temperature of 166° F for a minimum of 15 seconds is required if the total solids of the product is greater than 18%.

F. Reconstituting NDM for Fortifying Milk for Cheese Making.

The FDA Standards of Identity for Cheddar and many other types of cheese allow addition to the milk of “cream, skim milk, concentrated skim milk, nonfat dry milk, and water in a quantity sufficient to reconstitute any concentrated skim milk or nonfat dry milk used.”

Note:

> Dry whey and WPC are not allowed in most cheeses which have a standard of identity (except as noted in the guidelines for starter media in Item C14—Media Storage & Reconstitution).

If water is used to reconstitute the NDM, it must be potable, filtered, and the resulting reconstituted milk must be pasteurized except as noted in paragraph D above. This pasteurization step is required even if the cheese is labeled as made from raw milk. The plant may blend the pasteurized, reconstituted milk with other heat-treated milk to produce raw milk cheese (see item C54 for labeling requirements of raw milk or heat-treated milk cheese). Pasteurization requirements are the same as outlined in paragraph E above.

If milk is used to reconstitute the NDM, the resulting cheese milk is considered a raw product, even if pasteurized milk is used. If the plant is reconstituting the NDM without subsequent pasteurization (to avoid an excessive number of heat-treatments) the cheese shall comply with the labeling requirements of raw milk cheese as outlined in item C54. Pasteurization requirements are the same as outlined in paragraph E above.

Also check the following items:

1. A dump hopper and adequate dust control must be present. A powder funnel and effective dust control would meet the minimum requirements (use blank Item C11 to list any deficiencies).

2. The NDM shall be reconstituted in a processing area or its equivalent. If the dumping is done in the raw milk receiving area recommend a reduction in status unless this practice is discontinued immediately (use blank Item C11 to list this deficiency).

3. The funnel (if used) and associated piping may not be attached directly to the cheese vat. If you observe this make an appropriate comment under Item C23—Make Vats & Agitators and recommend a reduction in status unless the plant makes the required corrections during the survey.

4. If large bulk bags (Super Saks, Jumbo Bags, etc.) are used, follow the guidelines for Item D45—Tote to Bag Packaging.

G. Standardizing Cheese Milk With Whey Cream.

Whey cream can be used to standardize the cheese milk, in the plant where it was produced, provided it is properly handled and the process is inspected by the USDA (Page W is required).

The whey cream should be pasteurized, either in separate equipment at a minimum of 166° F for not less than 15 seconds, or by addition to the cheese milk in the constant level tank of the HTST. If the whey cream is added to the balance tank, the mixture can be pasteurized at a minimum of 161° F for not less than 15 seconds. However, a pasteurization temperature of

166° F for a minimum of 15 seconds is required if the fat content is above 10% or the total solids is greater than 18%.

When the whey cream is not pasteurized, the cheese shall be labeled as “raw milk cheese” or “cheese for manufacturing” (see the guidelines for Item C54 for labeling requirements).

Item C6—Heat-Treating or HTST Equipment (58.128).

See the guidelines for Item B6— HTST or Vat Pasteurizer.

If the milk for cheese making is either heat-treated or pasteurized, cross out the nonapplicable part of the heading on the report to properly indicate the kind of equipment being inspected. Use this item to make any recommendations needed with respect to sanitation or condition of the equipment.

Example:

C6 ~~Heat-Treating or~~ HTST Equipment
or
C6 Heat-Treating ~~or HTST~~ Equipment

When raw milk cheese is made, show NA for this item and also item C5—HTST Sealed ___ at ___ sec, ___ ° F and use item C7—Heat-Treated at ___ sec, ___ ° F to cover inspection of the preheater used for adjusting the milk to setting temperature.

Item C7—Heat-Treating at _____ seconds _____° F (58.128, 58.439).

When the milk for cheese making is only heat-treated, show the temperature and hold time directly in the item heading.

When only heat-treating is intended, it is not required that the equipment be timed and sealed. When only heat-treating is practiced, check this item satisfactory even though essential pasteurizing components may be missing (see the guidelines for Item C54 for labeling requirements).

Also, there is no legal minimum temperature and holding time for heat-treated milk for cheese making. However, the FDA requires that when the whey is intended for making Grade A Dry Whey, heat-treating of the milk for cheese making (in lieu of pasteurization) must be at a temperature of at least 147° F for at least 21 seconds, 153° F for at least 15 seconds, or other acceptable equivalent time-temperature relationship, using “3-A” equipment. The intent of this minimum heat-treatment is to reduce the number of staphylococci so that development of enterotoxin is less likely during the cheese make procedure and prior to the pasteurization of the whey. Of course, the Grade A inspection agencies will have the responsibility to check for compliance with these heat-treatment and equipment requirements at plants making whey or whey products for Grade A use. If such plants also have USDA inspection, simply report hold

time and temperature actually used in the same manner as for any other heat-treating cheese plant.

Item C8—Vacuumizer (58.128p).

See the guidelines for Item B7—Vacuumizer.

Item C9—Storage Tanks (58.128d, 58.143).

See the guidelines for Items A28—Storage Tanks - Silo & A29—Storage Tanks - Horizontal.

Item C10—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Starter Facilities

Item C12—Room Construction (58.126, 58.406).

See the guidelines for Item A1—Room Construction.

The wording of §58.406 permits either, 1) a separate starter room or, 2) “properly designed starter tanks and satisfactory air movement techniques.” Although a separate starter room is desirable, it is not required when specially designed bulk starter tanks are used. Such tanks usually have enclosed dome tops, high efficiency filtration of air admitted to the tank, and are mechanically cleaned. Although a separate starter room is not required, starter making is still considered a processing activity. Therefore, the tanks must be located in a processing room or area and shall not be located near areas where contamination is likely to occur. These same requirements apply to secondary starters. In addition, starters shall not be processed in close proximity to equipment such as boilers, open type separators, whey tanks, or other probable sources of contamination.

Also check the floor, walls ceiling and lighting in the room or area. Make recommendations as may be necessary. Floor drains are not required if the floor is sloped to drain to an exit.

If the plant is using “direct set” starter, show NA for Items C12-18 because special starter facilities are not needed. In such case, show the heading “Direct set starter use” for blank item C19. Check the item satisfactory if the plant is thawing the cans of concentrated culture and drying the can exterior in a sanitary manner before adding the contents to the vat (it is not necessary to check plant facilities for storage and thawing of the cans of starter).

Item C13—Lighting & Ventilation (58.126d, 58.406).

See the guidelines for Item A2—Lighting & Ventilation.

The manager should be encouraged to provide a filtered air supply to the starter room. The air should be obtained from an outside source and thereby provide a positive pressure in the room to minimize the possibility of contamination. Air filters for ventilation of starter rooms should have a minimum average efficiency of 90% when tested by the ASHRAE Synthetic Dust Arrestance test (same efficiency as required for spray dryers for air to be heated). This is intended as a guide for management regarding a minimum efficiency for such filters. It is, of course, optional if more efficient filters are chosen. Since this is a “should” item, it will not be necessary to ascertain efficiency of existing filters or to report such information on the report.

Item C14—Media Storage & Reconstitution (58.126e, 58.128).

Many plants use special dry bulk starter preparations to make up bulk starter. It is not necessary for bulk starter media to be manufactured in a USDA approved plant. All other dairy ingredients in the cheese that are allowed by a standard of identity shall be from approved sources.

Check for orderly storage of bags of starter media up off the floor on racks or pallets. When considerable amounts of starter are made, a separate room should be recommended for storing a small supply of media and for performing the dumping and reconstitution operations.

Inspect the equipment used for reconstitution (usually a funnel and recirculating pump). If a Ladish Company "Tri-Blender" is used, check that the valve between the funnel and pump is an approved 3-A sanitary type. They are sometimes supplied for food uses with a series 55 butterfly type valve that does not conform to 3-A requirements. If so, recommend replacement. If possible during the survey, also check that bag dumping is carried out in a sanitary manner.

Misuse of starter media in the cheese making process is a serious problem. This involves the use of excessive amounts of starter media, the inappropriate addition of secondary starters, or the addition of dry starter media for the fortification of milk for cheese making. Secondary starters, when used in appropriate amounts should not be criticized In cheese making, active starter culture is generally added to milk at the rate of 1-2%. Consider amounts of 3% or more added starter (including secondary starter, if used) as excessive. When observed usage is greater than 3% recommend discontinuing the improper use of starter to fortify the cheese (category A deficiency).

Whether using commercial starter media or plant blended whey fractions, the starter culture shall be viable. If the starter does not contain an active culture, it is being used to fortify the cheese milk. However, only the optional ingredients listed in the Standard of Identity can be used to fortify the cheese milk. Therefore, secondary starter that contains whey fractions cannot be heat-treated just before being added to the vats. If the starter is being misused in this manner, notify the National Field Office and assign the INELIGIBLE status (category A deficiency).

The use of secondary starters is acceptable, provided they are used according to all the above guidelines. In summary:

1. Less than 3% total starter is used.

2. Appropriate temperatures are used.

3. Handled as a starter (i.e., made in the starter room or specially designed starter tanks).

4. Appropriate powder handling equipment is used for reconstituting the secondary starter media.

Item C15—Media Heat-Treating Equipment (158.128j, k).

See the guidelines for Items A27—Product Cooler and B6—HTST or Vat Pasteurizer. Show NA for this item (use Item C16) if the plant performs the heat-treating in the starter making vats, which is a common practice in small or medium sized operations.

Use this item to cover inspection of equipment used for continuous heat-treating of bulk starter media prior to piping to starter vats for inoculation. Such equipment usually consists of heat exchangers to bring the temperature to 200-250° F, a hold tube, and regenerative cooler. Because of the high temperatures used, pasteurization is not required (timing and sealing of the unit and other public health controls are optional). However, the equipment shall meet the applicable 3-A Sanitary Standards.

Item C16—Processing Vats (58.415).

Inspect the processing vats for condition and cleanliness giving particular attention to appurtenances, such as vents, agitator, valve outlet, etc. Also, check that the vats are made of stainless steel, in good repair, equipped with tight fitting lids and have adequate temperature controls such as valves, indicating thermometers, and recording thermometers.

§58.415 requires that, "New or replacement vats shall be constructed according to the applicable 3-A Sanitary Standards" (formerly a "should" item). There is no special 3-A Sanitary Standard that pertains only to starter vats. However, there are two 3-A Sanitary Standards which are applicable to commonly used processes of starter making:

1. When the bulk starter media is mixed, heat-treated or pasteurized, set, incubated, and cooled in the same vat, *3-A Sanitary Standards for Non-Coil Type Batch Pasteurizers, Number 24-* is applicable (this process is likely to be encountered at only small or medium size cheese operations).

2. When the bulk starter media is heat-treated with continuous type heating equipment and is then piped to a vat for subsequent inoculation and incubation, *3-A Sanitary Standards for Non-Coil Type Batch Processors for Milk and Milk Products, Number 25-* is applicable for the vat (this process is most popular at medium or large size cheese operations).

If inspection of <u>new</u> or <u>replacement</u> vats reveals no 3-A symbol, handle in the same manner as outlined for item A3—Pumps, Pipelines, & Valves.

Show NA for this item if the starter is made in cans, which is a satisfactory option.

Item C17—Starter Cans or Pipelines (58.128a, 58.131a).

See the guidelines for Item A3—Pumps, Pipelines, & Valves or Item A5—Condition of Producer Cans.

The handling, cooling, and storage of starter in stainless steel or well tinned clean milk cans is a satisfactory practice. Check several empty cans, if available, using the inspection guidelines for Item A5—Condition of Producer Cans. When more than 10 percent are in an unsatisfactory condition, show a recommendation for correction and a summary of the inspection results.

If starter is <u>made</u> in cans, check that the cooking and cooling tank is maintained in a clean condition. Also, check the pails, utensils, etc. for cleanup and condition.

When starter is conveyed to vats with pipelines, inspect the pump, pipelines, valves, and fittings and use this item to report any deficiencies.

Item C18—Housekeeping (58.126e, 58,127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Cheese Room

Item C20—Room Construction (58.126, 58.407).

See the guidelines for Item A1—Room Construction.

Also check that the room is of adequate size and the equipment spaced to permit movement around the equipment for proper cleaning and satisfactory working conditions.

Item C21—Lighting & Ventilation (58.126d, 58.407).

See the guidelines for Item A2—Lighting & Ventilation.

Filtered air ventilation should be encouraged for make rooms, but it is not mandatory if ventilation is otherwise adequate (a “should” item of §58.407).

Item C22—Pumps, Pipelines & Valves (58.128, 58.146a).

See the guidelines for Items A3—Pumps, Pipelines, & Valves.

Item C23—Make Vats & Agitators (58.128, 58.416, 58.417).

A. Conventional Open Cheese Vats and Tables (58.416, 58.417).

Open cheese vats and tables shall meet the requirements of the 3-A Sanitary Standards for Cottage Cheese Vats, Number 38- .

Carefully inspect the condition and sanitation of the vat liner. The vat bottom should be relatively smooth and allow free drainage of the whey to the outlet valve. Check cleaning of the outlet valve and sump. Outlet valves shall be of a sanitary type. Outlet valves with bevel seats should be removed daily for hand cleaning.

Examine around the outlet valve and the top corners of the vat liner for cracks. Small cracks in the top of a drain table or vat should be assigned to category C. However, cracks in a jacketed vat that might allow heating media into the cheese should be assigned to category B.

Agitators shall be of the closed type which are so designed as to protect the product in the vat from potential contamination from the moving parts in the agitator assembly.

Check that exterior surfaces of agitators are kept clean and that exposed interior surfaces are cleaned as necessary to keep them relatively free from accumulated rust, dirt, etc. §58.417 requires that “all product contact surfaces, shields, shafts, and hubs shall be constructed of stainless steel or other equally corrosion-resistant metal.”

Do not recommend replacement of painted metal shields with stainless steel shields when they are located on open rail type agitators. Instead, recommend remodeling or replacement of the entire unit.

Iron agitator hubs and shafts are unsatisfactory, recommend replacement with stainless steel. Aluminum hubs in good condition should not be criticized. However, they should be carefully checked as they are often found broken or in excessively worn condition. Agitator hubs shall not be painted. When painted hubs are noted, recommend removal of the paint.

When oil seepage is noted on the agitator shaft, recommend correction (usually requires a new oil seal or perhaps new bearings and an oil seal). Assign this deficiency to category B. If the oil is noted in the product assign this deficiency to category A.

B. Enclosed Cheese Vats and Tables (58.416).

Enclosed cheese vats and tables, installed after November 16, 2003, shall meet the requirements of the 3-A Sanitary Standards for Enclosed Cheese Vats and Tables, Number 83- .

These vats are either round and have one or more vertically mounted agitators (such as the Double O vats), or may have one or more horizontal agitators (such as the OST vats),. The agitators usually also perform the function of cutting the curd. After the curd is cooked, whey may be predrawn and then the remaining curd and whey slurry is usually pumped to drain tables for subsequent manufacturing steps. Cleaning is usually accomplished by means of factory installed devices for mechanical cleaning in place.

Spray devices, for the addition of nondairy ingredients intended to remain in place during processing operations, if provided, shall be designed, such that their exposed exterior surfaces inside the vat meet product contact surface requirements and are readily accessible, readily removable and inspectable. Interior surfaces of pipelines and spray devices supplying nondairy ingredients are not required to meet product contact surface finish requirements except when included in a mechanical cleaning circuit for product contact surfaces. Also, there are no minimum radii requirements for orifices in spray devices used for incorporating non-dairy ingredients or potable water.

As with conventional vats, inspect all interior surfaces and appurtenances for condition and cleanliness. This may require entering the vat. Before doing so, arrange with management for making sure that the unit cannot be started while you are inside (use the lockout/ tagout device supplied by the National Field Office) and check the plants confined space entry program (see Section I, Item P).

The Damrow “Double O” enclosed cheese vat has been widely used in the cheese industry for many years. Following are areas which require close inspection during plant surveys.

1. The points which are the indentation of the figure ”8“ shape of the interior of the vat are high stress points for the stainless steel of the bottom. Check these areas for stress cracks.

2. The bottom discharge depression is also subject to stress cracking.

3. Check for product remnants on the knife assembly (including the underside), knife bearing assembly and the discharge valves.

4. Check for stress-cracks on the exterior of vat near the outlet valve.

5. Look for metal to metal contact that can occur if the agitator shaft is not properly aligned.

6. Check the areas on the upper surfaces where the agitator braces are attached.

When inspecting enclosed horizontal cheese vats, such as the HCV or OST cheese vats, inspect all interior surfaces and appurtenances for condition and cleanliness. Because of the arrangement of the agitator(s) in this type of vat it is not safe to enter. The rear seal (drive end) of the agitators in these vats are supplied with a CIP line. The front seal rides in a plastic bushing. Inspect at least one set of bushings each survey. Inspecting the front bushing will require the agitator to be supported by a hook while the plate on front of the vat is removed. There should be enough room between the drive motor and the vat to slide the rear bushing out enough to inspect it.

C. Miscellaneous.

During cheddar cheese making operations, you may note the addition of calcium chloride, artificial color, hydrogen peroxide solution, catalase preparation, and special curing enzymes in addition to the normally employed starter, rennet (or other milk clotting enzyme), and salt. All of these materials are permitted by the *FDA Standard of Identity*, which also outlines applicable limitations, labeling requirements etc.

When special enzymes are added to aid in curing or flavor development of Cheddar cheese, no special labeling is required for the finished cheese when the enzymes are added early in the making process, before the curd is formed. However if the enzyme preparation is added directly to the curd or cheese, the finished cheese must be specially labeled, for instance, “Enzyme Modified Cheddar Cheese.”

For some varieties of cheese (Asiago, Blue, Gorgonzola, Parmesan, Reggiano, Provolone, Romano, Swiss, and Emmentaler) the FDA Standards of Identity allow the bleaching of the milk with benzoyl peroxide or a mixture of benzoyl peroxide with potassium, calcium sulfate, and magnesium carbonate.

It is not the intent here to outline the wide variety of permitted ingredients and making procedures for standardized cheeses. Evaluation of plant practice in this regard requires a thorough knowledge of the standards. Checking for proper use of these materials would also

take considerable time, so this is not a USDA survey responsibility. Nevertheless, if you should note apparent improper use, either recommend correction or ask for supervisory guidance when you need assistance.

Item C24—Drain Tables (58.128, 58.416, 58.417).

See the guidelines for Items C23—Make Vats & Agitators.

In general, the construction and inspection guidance for conventional open cheese vats also applies to drain tables. Many drain tables, however, are equipped with special mechanical devices for pushing the curd and with special end designs for feeding the curd to bulk cheese conveying systems. Inspect such mechanical equipment carefully for cracks, poor condition gaskets, sanitation, etc.

Most drain tables have a center drain trough, covered by perforated or slotted drain plates. Remove some of the drain plates for inspection of condition (criticize cracks, rough welds, etc.) and cleanup. Also check the vertical trough outlet pipes as these are sometimes overlooked during cleanup.

Some drain tables (Damrow) have end gates which are gasketed with transparent tygon hose slipped over a formed stainless steel rod and held in place with a hose clamp. If the hose is cracked, or cut, or contains liquid, recommend replacement of the hose and use of end fittings which do not leak (a redesigned gasket is available that utilizes a solid gasket in place of the hose).

Make vats and drain tables should be washed between makes (cleanup between makes need not be as thorough as would be expected at the end of the day's operation).

Item C25—Curd Knives, Forks, Rakes, Misc. (58.128, 58.417, 58.419).

Cutting the cheese into uniform size cubes is important for proper cooking, salting, and composition control. Inspect the curd knives for cleanliness and missing wires. Show as unsatisfactory when wires are missing, or broken (more than two vertical or two horizontal). Also make a recommendation if the wires are excessively loose. Check for satisfactory storage of knives when not in use.

Inspect the forks, rakes, and miscellaneous utensils for cleanliness and condition. These items shall be made of stainless steel or plastic material that meets the *3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* . Recommend repair or replacement if these items are in poor repair, have cracks, crevices, rough welds, or cannot be cleaned properly. Remove the rubber from the stainless mounting on the squeegee and check for cleanliness. This should be removed daily for proper cleaning. Wood rakes or handles are not acceptable. Also check for satisfactory storage of utensils when not in use.

Some strainers, although constructed of stainless steel, are fabricated with crimped joints. When such strainers are noted in poor condition, recommend replacement with new strainers having seamless construction.

Item C26—Mech. Draining, Matting Equipment (58.128, 58.418a, b).

Show NA for this item if the plant uses conventional vats or vats and drain tables.

If the plant uses special automatic or semiautomatic cheddaring equipment, inspect product contact surfaces for condition and sanitation.

The USDA, Dairy accepted design of the Damrow DMC Machine provides openings for the shafts supporting the belt to pass through the sides of the machine. These openings permit the bearings (both grease and Teflon type) to be located outside of the product contact area and therefore eliminate the possibility of contamination from these bearings.

While the DMC machine is being CIP cleaned, a sizeable amount of cleaning solution can be lost through these openings. To salvage this solution, pans have been installed below the openings to catch the CIP solution and return it to the DMC machine for recirculation. This is an acceptable practice.

During the cheddaring process, a small amount of whey is lost through these same openings. The piping which attaches the catch pans to the machine for CIP solution return shall be disconnected during operation. Whey that is collected in these pans during operation has been in contact with unsanitary areas and shall not be salvaged for human consumption in USDA approved plants.

If the cheese manufacturing plant is salvaging this whey, inform the plant management that this is an unsatisfactory practice. If plant management elects to immediately disconnect this piping during the survey, lower the plant status to ensure the practice is being discontinued. If plant management either cannot or chooses not to disconnect the piping during the survey, assign the INELIGIBLE status to all codes which include whey.

Item C27—Curd Mill (58.419).

Product contact surfaces of the curd mill shall be made of stainless steel or be well tinned. Check that the motor and drive mechanism are mounted or guarded to prevent dirt or grease from dropping into the vat. Also check that there is no metal-to-metal rubbing of parts which might shave off metal particles into the cheese. Old style mills with bolted blades and exposed threads should be replaced with welded assemblies.

Use care during inspection as mills have many sharp edges.

Most mills for Cheddar Cheese are the rotary type, but Mozzarella “milling” is often accomplished with dicer type units using a reciprocal plunger to force the curd through sturdy

knives. On such units, inspect all product contact parts for cleanliness and condition, including the hopper, chamber, plunger, and knives.

Item C28—Mixing & Molding Equipment (58.428).

When the plant makes Mozzarella cheese, use this item for listing deficiencies with the cheese mixing, molding, and cooling operations.

A. Mixing Equipment.

New or replacement equipment shall meet the *3-A Sanitary Standards for Italian-Type Pasta Falata Style Cheese Cookers, Number 70-* .

Modern mixers for the cheese and hot water usually employ one or more augers to continuously mix and convey the cheese from a mill or dicer to the molding machine. Some older mechanical mixers are batch type, however, and use paddles or arms to mix the cheese and hot water in a portable kettle. Either type is satisfactory. Inspect all parts for condition and sanitation. Augers should be removable for cleaning, or design provision should be made for easy effective daily cleaning of all product contact surfaces, including seals or bearings located in the product zone.

The 3-A Sanitary Standard allows certain surfaces to be coated with Teflon or shot peened to prevent the cheese from sticking. When surfaces are coated with Teflon, check for adherence. Recommend recoating when the Teflon is peeling or deteriorated. When surfaces are shot peened, they will be slightly rougher than a number 4 finish.

Steam introduced for direct injection heating of the water shall be culinary and meet the requirements as outlined in the guidelines Item A36—Culinary Steam.

Inspect the hot water tank, pump, related piping system and temporary storage tank for the hot water-fat mixture, which is usually separated to recover the butterfat.

There is no objection to the reclaiming of milkfat, milk solids, or brine fractions of the cooker/stretcher water provided the component streams are handled in a sanitary manner and in properly designed and constructed equipment.

<u>Note</u>:

> For the purpose of this section of the guidelines the brine fraction is the excess salt extracted from the cooker/stretcher water. This should not be confused with brine systems used later in the process to cool and salt the cheese.

Any milkfat reclaimed will be considered whey cream, and any milk solids reclaimed will be considered as whey or salty whey suitable for intermixing with other human food products as appropriate.

The quality of the milkfat and milk solids reclaimed should be monitored carefully. The repetitive pumping at elevated temperatures may result in deteriorated quality. While acceptable from a sanitary standpoint, the quality may not be sufficient to produce finished products of satisfactory quality.

When inspecting systems from which the milkfat, milk solids, or brine fraction is reclaimed, the following criteria shall apply.

1. Salt slurry makeup systems shall use potable water. They shall be constructed consistent with the salt slurry systems used for the injection of salt into continuous butter churns (See the guidelines for Item B17—Churn(s)).

2. Because of the relatively small volumes of salt brine in cooker/stretchers, there is no objection to mixing this brine in with properly collected and handled salty whey prior to reclaiming the product in a membrane system. If a membrane system is used to separate the salt brine from the milk solids fraction, pasteurization is required. The pasteurizer shall be properly engineered and installed, and be timed and sealed by the state regulatory authority. For USDA acceptance, the pasteurizer may be located either before or after the membrane unit. However, the plant should be aware that the FDA generally requires that the pasteurizer be located prior to the membrane unit.

   Reclaimed brine solutions recirculated back to the cooker/stretcher shall be handled in equipment designed and constructed to product contact standards. This is required so the system can be effectively cleaned in the event a failure in the membrane system allows milk solids to be introduced into the brine recirculation system.

3. The cooker/stretcher water shall be stored at temperatures either greater than 145° F or less than 45° F until it is processed to recover the fat, solids, or brine fractions.

4. Reclaimed milk solids (whey) shall be considered as raw and shall be pasteurized at some appropriate point during processing and before leaving the plant.

5. If the reclaimed milk solids are further processed by separation, the following shall apply:

   a. The separator shall be a sanitary design dairy separator.

   b. Milkfat (whey cream) may be added back to the raw milk balance tank prior to pasteurization for cheese making or be cooled and blended with other whey cream for shipment to another plant or used for butter making. If blended with cream, the entire blend shall be labeled as whey cream.

   c. The heavy phase (milk solids and salt) may be combined with other salty whey for further processing or disposal. See the guidelines for processing salty whey (Items W47, W51, and W52).

d. If a self cleaning (desludging) separator is used the sludge or “shoot” material shall be disposed of as waste. This product shall not be reclaimed as human food.

6. The cooker/stretcher water shall be processed or dumped following the end of each days production. The cooker/stretcher water shall not be held over and used the following day, nor assembled for several production days before further processing in order to increase the volume to be processed.

B. Molding Equipment.

New or replacement equipment shall meet the *3-A Sanitary Standards for Italian-Type Pasta Falata Style Cheese Moulders, Number 71-* .

Molders usually are Teflon coated or have shot peened surfaces to prevent the cheese from sticking. Molders consist of hopper and auger(s) for forcing the warm cheese into desired shapes and sizes. Inspect for condition and sanitation as outlined for mixers.

C. Cheese Forms, for Cooling (if used).

See the guidelines for Item C46—Hoops, forms, & Press Cloths.

New or replacement equipment shall meet the *3-A Sanitary Standards for Italian-Type Pasta Falata Style Moulded Cheese Chillers, Number 72-* ,

A common commercial style for Mozzarella cheese is the five or six-pound loaf. To facilitate handling of the stainless steel loaf forms, they are sometimes fastened together, three or four to a unit, with welded stainless steel straps or bars. Check for open seams at point of welding, particularly if strip or spot type welding is employed. Since the entire form and the exposed cheese are immersed in the cooling water, open seam areas at fastening points have direct sanitary significance and are unsatisfactory. Plastic forms shall be smooth, in good condition, and free of cracks. Also, check for proper storage of the forms when not in use.

D. Cheese Cooling.

Cooling is usually accomplished by immersion of the cheese, with or without forms, into cold water or brine. The water may be flowing continuously or may be refrigerated and recirculated. If recirculated, the water should be drained at the end of the day. In addition, all surfaces that the water contacts shall be considered product contact surfaces.

Chilling of the water with immersed refrigerated copper coils should not be criticized. Copper coils shall not be used to cool brine.

Some special molding machines also have refrigerated jacket type surfaces to accomplish a dual function of molding and cooling.

Item C29—Salt Storage & Handling (58.418c).

See the guidelines for Item B19—Salt Storage & Handling.

A. Manual Salting.

Salting of American cheese at many plants will consist of manual spreading of the salt on the curd in the make vat or drain table, followed by a period of mechanical forking and mellowing prior to hooping.

Pails used to salt the cheese shall not be stored on the floor.

B. Automatic Salting.

If salting is performed by a machine, the automatic salter shall be constructed of stainless steel or other equally corrosion resistant metal and should be constructed to equally distribute the salt throughout the curd. It shall be designed to accurately weigh the amount of salt added. It shall be constructed so that it can be satisfactorily cleaned. The salting system shall provide for adequate absorption of the salt into the curd. Sometimes steam is used to moisten the curd during salting. If this is the case, the steam must comply with the guidelines for Item A36—Culinary Steam.

Inspect the automatic salting system for compliance with these requirements. Make recommendations as may be applicable.

The salting machine is often a separate unit which requires conveyors to bring the curd to it. For the manufacture of cheddar cheese, the conveyors are usually belt or vibratory type and are located just after the curd mill. Inspect such conveyors for sanitation and condition and make any needed recommendations under this item number. Also, check that suitable means of access is provided for any elevated or hard-to-reach components to facilitate daily cleaning.

In connection with automatic salting machines, the salt is sometimes 1) bulk handled in tote bins, 2) dumped into a hopper for gravity feed, or 3) elevated to a feed hopper with an air conveying system or other conveyor. In such instances, check for sanitary dumping and handling to prevent contamination of the salt.

Item C30—Fines Return & Fines Saver (58.428).

Show NA for this item if the fines are not returned to the cheese.

Dismantle and inspect all components for condition and sanitation.

Encourage the practice of keeping the fines container up off the floor on a shelf, rack, or separate stand (when allowed to sit on the wet floor, water from the bottom exterior surfaces can fall in the cheese vat when the container is emptied).

Under most circumstances, the fines saver should be operated with a cover in place to protect the whey and fines from external sources of contamination. There may be exceptions, however, where such protection is afforded by location in a separate room or special area. When a cover is not employed, evaluate the situation and use your judgement.

Check that the screen, or any extra screens, are properly stored when not in use. Large radiator style hose clamps with exposed threads should be criticized.

If a separator-type fines saver is used, the areas that collect the fines shall meet product contact surface requirements. Check the *Accepted Equipment List* under the heading centrifuges to determine if the desludging section is acceptable for product contact. If the model is listed follow the inspection guidelines for Item B4—Separator. In addition, inspect the fines collection and outlet area. If a water rinse is utilized to flush the fines back to the drain tables or into a storage tank where they are to be reclaimed for human food, see the guidelines for Item A35—Product Rinsings.

Item C31—Hand Washing Facilities (58.127c).

See the guidelines for Item B21—Hand Washing Facilities.

Hand washing facilities shall be available in the immediate work area. Employees should wash hands prior to handling product; if possible, determine if this practice is being followed. When deficiencies are noted, recommend correction.

Item C32—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Brushes and cleaning materials should be kept in their proper place and miscellaneous utensils such as forks, rakes, pails and strainers should be stored in a sanitary manner. Also, check floors under cheese vats and the underside of vats and equipment for cleanliness following equipment cleanup after the day's operations.

Item C33.

Use this item with appropriate heading to cover improper use of defoamers or any other cheese making equipment located in the make room and not listed in this section.

Although defoamers are allowed to be used in whey, they are not allowed in whey cream, cream, or cheeses covered by a Standard of Identity such as Cheddar cheese. A defoamer is not permitted for use in such cheeses unless specifically listed in the optional ingredients section of the standards. However, due to specific functional needs and additional regulations covering the manufacture of reduced fat cheeses, a defoamer may be used for the manufacture of standardized cheeses that are formulated to comply with low fat or reduced fat label declarations. The improper use of a defoamer does not constitute a serious breach of a Standard of Identity. If during a survey a defoamer is used in the production of a standardized

full fat cheese, recommend that the plant discontinue its use immediately and assign the deficiency to category C. If on subsequent surveys a defoamer is still in use, elevate the deficiency to the next higher category until the plant has taken appropriate action.

Cheese Brine Facilities

Item C35—Room Construction (58.126, 58.408).

Preferably, cheese brine tanks should be in a separate room constructed so it can be readily cleaned. However, a separate room is not a requirement, so do not criticize brine tank location in a make room or packaging room, for instance, provided there is sufficient room and no interference with other processing activities.

If the factory does not salt cheese by the brine soaking method, show NA in the report heading for this section and leave Items C35-41 blank.

Item C36—Lighting & Ventilation (58.126d).

See the guidelines for Item A2—Lighting & Ventilation.

Item C37—Brine Tanks (58.422).

The brine tanks shall be constructed of suitable nontoxic material and should be resistant to corrosion, pitting or flaking. Good condition concrete or tile tanks are satisfactory. However, when flaked or deteriorated condition is noted and replacement is needed, recommend replacement with stainless steel, fiberglass-covered wood, or other suitable nontoxic material. Because of the strong corrosive effect of brine on most metals and paint, the tank exterior surfaces, legs, or other framework should also be constructed of stainless steel, fiberglassed wood, or other corrosion resistant material.

Fiberglass brine systems are to have surfaces that are at least as good as a good condition concrete tank. Fiberglass tanks should not possess rough, pitted surfaces with fabric folds or exposed fibers.

When unacceptable brine tank surfaces are noted, fill out a Nonconforming Equipment Report and attach it to the survey report so follow-up action can be taken with the manufacturer. Appropriate recommendation to bring the surfaces into compliance should also be made on the survey report.

Brine tanks may be mounted one atop the other, provided the exterior of the top tank is constructed to the same specifications as the product contact surfaces of the tanks. If such deficiencies are noted, describe them on the report together with a recommendation to correct the condition. Also, check for cleanliness and presence of mold on the underside of the tanks. Employees shall use sanitary procedures when working with the top vats. Employees shall not stand on the edge of the lower vat. If noted, recommend that this practice be stopped immediately. Also evaluate the adequacy of alternative means of access provided by management.

Walkways over brine tanks shall be solid so that debris cannot fall into the tanks. In addition, there shall be a kick plate a minimum of 4-inches high on the portion of the walkway over the tank.

Item C38—Control of Brine Quality (58.422).

The brine tank shall be operated so as to assure the brine is clean, well circulated, and of the proper strength and temperature for the variety of cheese being made.

In a very small cheese operation, minimum compliance might be achieved by locating the tank in a cooler room for temperature control. However, note that without circulation brine strength tends to stratify as salt is absorbed into the cheese from the top of the tank.

When the brine tanks are located in a regular processing room, cooling of the brine may be necessary. The preferred method is for recirculation of the brine through a filter and cooler (plate or tubular type, for instance) and back to the tank. The filter removes impurities, the circulation prevents stratification of brine strength in the tank, and the cooler removes heat imparted by the cheese.

Cooling of brine with refrigerated copper coils immersed in the brine tank is a questionable practice. Excessive copper salts may be in solution in the brine and be absorbed by the cheese. Therefore, copper coils are unsatisfactory, recommend replacement with stainless steel.

Since the brine is very corrosive to ferrous metals, the piping used for recirculating the brine through the filter and cooler and back to the brine tank is often constructed of special stainless steel or rigid polyvinyl chloride (PVC). The use of rigid PVC piping for this purpose should not be criticized.

Plant testing for microbial contamination and salt strength should be encouraged to aid in maintenance of brine quality. As may be necessary, tanks should be cleaned and the brine should be heat-treated or filtered to control microbial contamination.

Note:

> When the brine quality is under good management control as indicated above, USDA has no recommendation for frequency of dumping old brine and making up a new solution. The frequency is a management option.

Item C39—Miscellaneous Utensils (58.428).

Use this item to cover inspection of any special equipment or utensils employed in or around the brine tanks, including such items as tables for removing cheese from hoops, brine tank dividers, salt buckets, tools for moving the cheese, etc. Check that construction is of stainless steel, or rubber or plastic material that meets the 3-A Sanitary Standards and that 3-A principles

are followed in the fabrication. Also check for sanitation and proper storage of these items when they are not in use.

Item C40—Cheese Drying After Brining (58.428).

Check that facilities for drying cheese after brine immersion are constructed to protect the cheese from contamination. Product contact surfaces of such equipment must be made of stainless steel or rubber or plastic materials that meet the 3-A Sanitary Standards. If a drying tunnel is used, check interior surfaces for freedom from peeling paint or rust (because of brine, stainless steel construction is desirable although not required).

Item C41—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Cheese Packaging

Item C43—Room Construction (58.126, 58.410, 58.411, 58.413).

See the guidelines for Item A1—Room Construction.

A separate room for packaging rindless bulk cheese is not mandatory and the packaging operations may be conducted in the cheese make room (or any suitable section of a processing area).

The room or area shall be free from dust, condensation, mold, or other conditions which may contaminate the surface of the cheese or contribute to unsatisfactory packaging of the cheese.

When applicable for rind cheese, a separate room or compartment should be provided for paraffining and boxing the cheese. The room shall be of adequate size and the temperature maintained near the temperature of the cheese drying room to avoid sweating of the cheese during paraffining.

Item C44—Lighting & Ventilation (58.126d, 58.410, 58.411, 58.413).

See the guidelines for Item A2—Lighting & Ventilation.

Check for 30 F/C of light and light protectors.

If rindless bulk cheese is packaged in a separate room, ventilation of the room with filtered air under slight pressure is desirable, but this is not a requirement.

Item C45—Barrels, Carts & Conveyors (58.420, 58.424, 58.425).

Use this item for any deficiencies that could affect the quality or wholesomeness of the cheese. Deficiencies that affect the whey should also be recorded on Page W.

When applicable, check the condition of barrels used. Some barrels are constructed of steel, lacquered inside and painted outside, are poly lined, contain approximately 500 pounds of cheese, and require cleaning and paraffining after each use in order to be maintained in good condition. The empty barrels shall be stored in an enclosed, clean, dry area. When barrels are not properly stored or are rusty, in poor repair, not clean, or in need for reconditioning, make a recommendation for correction. Indicate how many barrels were inspected and how many were found unsatisfactory.

When American type cheese is hooped directly into barrels, whey drainage is usually facilitated by turning the barrel on its side with a portable cradle or by use of a mechanical sling from an overhead monorail. Some plants also have other special equipment for positioning barrels for drainage.

When a monorail is used, check for appropriately constructed shields under the monorail carriages to protect empty and filled barrels and whey drain pans from paint chips, rust, oil, etc. If no shields are present, recommend that they be provided.

When cheese is packed in large collapsible plastic or wooden boxes (waxed), inspect the box components for condition, and also check the filling, pressing, dressing, and final packaging operations.

Item C46—Hoops, Forms & Press Cloths (58.418e, 58.420, 58.421, 58.429).

Inspect hoops or forms for condition and cleanliness. Construction material shall be stainless steel, suitable plastic, or well-tinned iron (usually, tinned hoops are employed mainly for small styles). Check the forms for fabrication deficiencies such as bolted construction, rough product contact surfaces, cracks, crevices, etc.

Hoops for American Cheese shall be washed daily. Do not criticize the common practice of immediate refilling Mozzarella hoops for more than one use during the same day.

The *Accepted Equipment List* shows manufacturers of cheese molds that have obtained USDA acceptance of their products. To obtain this acceptance, the plastic materials used must comply with the applicable Food and Drug Administration regulations (21 CFR Parts 170 to 199) and also with the *3-A Sanitary Standards for Multiple—Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* . There are a variety of plastic materials available which meet both of these requirements and would therefore be satisfactory for use in fabricating cheese molds.

Several cheese plants which manufacture cylindrical shaped cheese such as Parmesan, Romano, and Longhorn styles of Cheddar and Colby have purchased rigid PVC (polyvinyl chloride) pipe of the proper diameter, cut it into proper lengths and use these as cheese forms. Since PVC has not been found to comply with the FDA requirements and the 3-A Sanitary Standards, it is unacceptable for use as cheese forms in USDA approved dairy plants. If any USDA approved dairy plant currently using PVC cheese forms, recommend the INELIGIBLE status (category A deficiency).

There are several other classes of plastics that do meet the requirements. These can also be purchased in lengths of specific diameter pipe, cut to the proper lengths, have holes drilled for whey drainage and be acceptable for use as cheese forms in USDA approved plants. Plastics such as polyethylene, polypropylene, polystyrene and extruded nylon which meet the requirements could be used. Cheese plants which elect to use acceptable types of plastics should request that the plastics supplier provide them with certification that the plastics meet our requirements. This certificate should remain at the plant for review during plant inspections.

When a mechanical hoop washer is used, inspect the machine for sanitary condition and maintenance. Check that solution temperature and pressure are controlled to achieve satisfactory cleaning of hoops. Check also for adequate venting to the outside. Make any needed recommendations under this item.

Examine press cloths for sanitary condition. When the appearance or odor of press cloths indicate improper cleaning, recommend adoption of an effective daily cleaning procedure. Badly worn, ragged cloths are also unsatisfactory, recommend replacement. Single service type press cloths should be used only once.

When used, the washing machine for press cloths should be of commercial quality and size or be of sufficient size to handle the applicable load. It should be equipped with temperature and water level controls. In effect, this means that family type washing machines are considered satisfactory for washing press cloths when they are properly loaded and are properly cleaning the cloths. If this is not the case, then larger commercial style washers should be recommended.

Item C47—Hooping Equipment (58.128a, 58.418b, d).

A. Manual Hooping.

Check that shovels, funnels, etc. are properly constructed and stored under sanitary conditions.

B. Automatic Curd Conveyors.

Salted curd is often moved to a hooping station for blocks or barrels by means of an air conveying system. §58.418b requires stainless steel construction, cleanable design, sufficient size unit, and provision with "filtered air of the quality satisfactory for the intended use. Air compressors or vacuum pumps shall not be located in the processing or packaging area."

The major uses of pneumatic conveying equipment are to move salted curd to hooping stations and to convey ground cheese to blending vats. All of the major commercially available systems (Damrow, Kusel, and Stoelting) use rather large volumes of air at low pressure of approximately 5-15 PSI to convey the cheese. Cubic feet per minute (CFM) depends on the sizing of the system, but usually falls into the 300 to 1300 CFM range for conveying cheese curd. Some large systems for conveying ground cheese may use considerably more. The slightly compressed air is usually supplied by rotary pumps commonly called "blowers" (as compared to fans which deliver very high quantities of air at very low pressures and to compressors which supply relatively low volumes of air at very high pressures). The rotary blowers usually have air prefilters of various types on the suction side. The blowers are made of iron and have iron appurtenances such as prefilter housings, sound mufflers, check valves, and associated piping. The interior surfaces of iron components are subject to rusting and therefore a downstream filter is required, together with corrosion resistant piping from the filter to the cheese pickup point.

Since the air blower is not located in the processing area, the air supply pipeline may be quite long. When the final filter is located near the blower, the air piping from the final filter may be made of threaded stainless steel, sanitary stainless steel (that is, with either welded joints or "3-A" fittings), aluminum, rigid PVC, copper, or any other suitable nontoxic material which is corrosion resistant. However, if other than sanitary stainless steel piping is used, conversion to sanitary stainless steel piping must be made a few feet upstream of the cheese pickup point. The connection should permit easy dismantling to allow take down and inspection of pipes

downstream of the connection. Another alternative would be to locate the final filter relatively close to the cheese pickup point, in which case iron piping can be used between the blower and the final filter.

Regular cleaning of the air line, upstream from the sanitary connection, should not be necessary if backflow of product or liquids is prevented during shutdown periods. Such backflow can be prevented by locating the sanitary connection in a vertical section of air piping which comes from above, toward the cheese pickup point. Where this is not practical and a horizontal air line is required prior to the cheese pickup, the sanitary connection should be taken apart and capped off during shutdown and cleanup operations (optionally, a valve might be installed to serve the same purpose). The system should have pressure relief protection to prevent damage in case the blower is accidentally started while the line is blocked.

Minimum filter efficiency should be 85% when tested in accordance with the ASHRAE Atmospheric Dust Spot Method when operated at its design face velocity (this is the same filter efficiency specified in 3-A Accepted Practices). We understand that the 85% efficiency by this test would approximate the removal of 93% of airborne particulates in the 1-5 micron range. Use of higher efficiency filters is a management option.

As with any filter installation, it is important that air bypassing be avoided by filter design or use of gaskets in the filter frame or cartridge (the physical shape and size of filters will vary considerably depending on design and size of the pneumatic system).

Other conveyors, such as auger, belt, or vibratory types, are also used to convey salted curd to the hooping station(s). Inspect conveyors for conformance to the §58.128a or §58.418b requirements as may be applicable.

C. Automatic Curd Filling or Hooping.

§58.418d requires stainless steel construction, cleanable design, sufficient size unit, and accurate control of curd weight into the container. Some curd filling units also have automatic devices for moving the containers through the machine and for tamping the curd. These automatic curd fillers are usually manually cleaned. Check for sanitation and condition and make recommendations as may be necessary.

Item C48—Whey Probes (58.428).

Use this item when the plant is making cheese in large styles such as barrels or 640's and is using vacuum probe equipment to withdraw whey from the cheese. Note any deficiencies to the exterior of the probes under this item. Deficiencies on the interior of the tubes and other fittings should be recorded on Page W, Item W6—Collection of Salty Whey. Use Item C45—Barrels, Carts, & Conveyors to cover inspection of barrel drain carts, conveyors, etc.

Probe design varies. Most probes consist of a tube within a tube. Dismantle the probes and slide the tubes apart. Check for sanitation and rough welds, open seams, etc. Make appropriate recommendations. Some 640 operations use a wedge-type system to allow the

whey to drain out the bottom of the box. Remove the wedges from the support and check sanitation and condition.

Item C49—Cheese Press (58.421).

A. Conventional Presses.

Check that presses are made of stainless steel with welded joints and cleanable surfaces, including trough, rails, rail supports, and press head. Also check that the pressure device is a continuous type which exerts uniform pressure on the cheese. This requirement can be satisfied by hydraulic or air type press devices, or by hand operated press jacks which exert continuous pressure by means of springs at either or both ends of the press. In the case of barrel cheese and some other types, weights may also be satisfactorily used to exert continuous pressure. When weights are employed, check that they are constructed and maintained in a satisfactory manner. Also, inspect presses for cleanliness, including exterior surfaces, and sanitary construction.

B. Tower Block Formers.

1. Preparation of towers for inspection:

Dairy Grading Branch inspectors shall not attempt to prepare the blockformer for inspection. The procedures for preparation prior to inspection must be performed by a qualified plant employee.

The blockformer control panel must be switched to “manual” mode. The front door should be opened and blocked with a suitable material to prevent accidental closing. Next the guillotine should be pushed back into the rear chamber by hand. Remove compressed air supply to the main control panel.

Check to see that all electrical switches are in the off position, and are locked out with padlocks.

2. Inspection:

Start at the top of the tower and work downward. Assistance of a plant employee will be required. Make recommendations as appropriate when deficiencies are observed.

The following guidelines can be used to inspect nonwelded towers as well as the new welded tower. Removal of the upper screen attachments used in the older towers will require removal of the exterior jacket of the tower. If this is done, it is recommended that only five screen bolts be removed and the areas between the screen and tower wall checked before replacing the retainer bolts. Note that each screen will have six bolts. Three upper and three lower. By removing three upper and two lower, the screens can be flexed enough to inspect the areas between the upper screen and tower. The sixth bolt can be left in place to hold the screen.

The older towers have plastic seals or washers to seal the screen retainer bolts and holes instead of USIT seals. Care must be taken so all parts are accounted for when plant employees reassemble the screen retainers.

Inspection of the lower sections of the older towers is performed the same way as the all welded tower.

Also, check the thin white sidewall flange gaskets for condition and cleanup. Make appropriate recommendations if soil accumulations, pitting, deteriorated gaskets, etc. are observed.

a. Remove the curd supply line, CIP lines, and top cover of the tower. Check the areas for proper cleaning, pitted areas, rough welds, deteriorated gaskets, and other construction deficiencies.

b. Dismantle and inspect the air valve assembly in the curd feed line. Observe for soil accumulations, deteriorated O-rings or pitted areas.

c. Inspect the CIP fittings, valves, and gaskets. Check spray balls for debris.

d. Check the gasket and underside of the top cover for condition and general cleanup. If the gasket is glued to the cover, it shall be firmly attached and shall be free of loose areas which could collect water or soil. The gasket should be flush with the tower interior when the cover is bolted to the tower. The gasket and surrounding areas shall be free of excess glue. If the gasket is torn, cracked or rough recommend replacement.

e. Place a clean plastic bag or other clean, suitable material over the block lift plate at the bottom of the tower. The material used should be placed to catch the USIT seals that may drop from the top of the tower when the screen retainer bolts are removed.

f. Remove <u>one side of one</u> screen at a time. If the bolts from both sides of one screen are removed at the same time, the screen may drop and become wedged in the lower part of the tower. The long side of the screen will have six bolts and the short side will have four bolts. One USIT seal will be positioned under each bolt head and one between the screen and sidewall of the tower. As the bolts are removed, the USIT seals between the screen and tower sidewall may fall to the lower part of the tower.

   Care must be taken to assure that <u>all</u> USIT seals and bolts are accounted for after they have been removed from the screens. If a seal becomes lodged between the screen and sidewall, shake the screen or use a water hose to flush the seal down to the plastic-covered lift table. <u>If USIT seals or bolts are left inside the chamber serious damage could result, and metal parts could contaminate the cheese or whey</u>.

Check the USIT seals and bolts for cleanup. Check for pitted bolt heads or USIT seals. USIT seals are not reusable, they shall be replaced with new ones. If extra seals are not available, perform the inspection, and instruct management to replace damaged seals at a later date.

After the bolts have been removed from one side or the other, fold the top section of the screen inward. Using a strong light, examine the exterior of the screen and inside wall of the tower. Careful attention should be given to the areas where the USIT seals rested against the screen and tower sidewall. Allow the screen to snap back in place and then check the interior of the screen surfaces. Loosen at least two sides of one screen for the inspection of the top areas of the tower. Observe for curd remnants or soiled areas. If the areas that are examined are found clean, it is not necessary to remove the second screen.

After the top screen(s) have been inspected, the bolts and USIT seals should be replaced and tightened before proceeding. A special tool is available for holding the USIT seals in place between the screen and tower sidewall as the bolts are being replaced (this tool will be provided by the tower manufacturer). The seals can only be replaced by using the special tool (use of silicone is not acceptable). If the seals are not replaced, it will be impossible to pull a satisfactory vacuum inside the tower.

g. Next examine the lower sections of the screens and tower interior walls. Using the highly polished stainless steel mirror supplied by the manufacturer, carefully examine the lower sections of the tower. Use a strong flashlight or spotlight to provide adequate lighting. It may be desirable to have another person hold the light either at the top or bottom of the tower while you inspect these surfaces. Check for soil accumulations, milkstone, or curd particles. There may be areas where the screen has rubbed the polished surfaces of the tower sidewall. If the areas are rough or pitted, make appropriate recommendations.

3. Examination of The Tower Base:

a. Remove the cover from the rear whey collection chamber. Check the cover gasket for condition and sanitation. Inspect the interior of the whey collection chamber for milkstone buildup or curd remnants.

Check the rubber seal above the guillotine. It should be clean and free of cracks, broken areas, and milkstone. Recommend replacement if the seal is damaged. The seal can be removed by simply pulling it off of the retainer pegs.

b. Check for soil behind the small metal flapper plate positioned directly above the guillotine seal. This plate acts as a check valve when vacuum is being pulled inside the tower.

c. Next remove one of the rear plastic bearings from the two guide rods for the block pusher plate. Check the seal around the plastic bearing. It should be clean and free of cracks or splits. If milkstone accumulations are noted on the plastic parts, recommend that the cleaning program be modified to provide proper cleaning.

The front bearings are pressed into the steel plate, and cannot be removed without damaging the bearing. If the bearing is tight, it should be considered satisfactory. If either of the bearings are loose, recommend that they be replaced with new ones.

Removal of the plastic block push plate requires considerable time. If the plate and rods are tight, they should not be removed for inspection. If the connections are loose recommend that new parts be installed. Check the plastic grooves for the guillotine. These grooves act as a bearing for the guillotine as it moves back and forth. The areas should be free of milkstone, curd particles, and black film.

d. Check the block lift plate and plate chambers. The area under the lift plate is a nonproduct zone. This area should be free of curd particles, product residue, and odors.

e. Inspect the front door assembly. If the doors are of the two-piece bolted type, have the parts taken apart. The inner areas should be dry and free of residue and odors. If the gasket is rough, cracked or stained recommend replacement.

Check the exterior areas of the door and cheese block discharge conveyor or slide. Careful attention should be given to the underside of the discharge slide assembly.

f. Open the electrical control boxes and remove the tower side panels from the base. Check the areas with your flashlight. These areas should be clean and free of product residue and insects.

4. Examination of Whey Removal Pipelines Valves and Tanks:

If the plant requests status for the whey operations, deficiencies in this area should be recorded on Page W.

5. Inspection of Vacuum Lines and Related Equipment:

Each tower is supplied with vacuum lines and a vacuum interceptor tank. As the cheese is vacuumed within the tower, vacuum is drawn through the interceptor which may or may not be located at the top level of the tower (some plants have the interceptors located at the base of the towers, either position is satisfactory).

There are two styles of vacuum interceptors. One style has a bolted cover and gasketed flange, the other is of all welded construction. All towers manufactured at this time have the all welded style interceptors.

It is normal for some moisture and fine curd particles to be drawn into the interceptor. Generally, the interceptors are not considered product contact areas. Valves at the bottom of the vessel remain closed until the towers are cleaned. At that time, the vacuum lines, valves, pumps, and interceptors are cleaned.

Inspection of the vacuum lines, pumps, pipelines, valves and interceptors should be limited to a general check of interior surfaces. Areas should be relatively clean and free of yellow build up. Do not become concerned if one or two small curd particles are noted inside these fittings. If on the other hand the areas have solids buildup, make appropriate recommendations to improve cleaning of the vacuum system.

Item C50—Cheese Vacuumizer (58.423).

Bulk cheese vacuum chambers, if used, should be installed so that floor surfaces underneath are effectively sealed or have enough clearance so they can be cleaned.

Inspect interior surfaces of the vacuum chamber for cleanliness and condition. Per §58.423, the vacuumizer "shall be satisfactorily constructed and maintained so that the product is not contaminated with rust or flaking paint. An inner liner of stainless steel or other corrosion resistant material should be provided." If the vacuumizer has peeling paint or rust conditions on the sidewalks or ceiling, recommend resurfacing, preferably by lining with stainless steel or other equally corrosion resistant metal. Coating with either hot dip or cold galvanizing compound would also constitute satisfactory protection of the interior surface.

Item C51—Wrapping Table & Scale (58.128m, 58.419).

If rindless cheese is made, check the facilities for wrapping and weighing. The table top for wrapping and the scale platform shall be stainless steel or other hard material that can be cleaned and maintained in sanitary condition.

It is not necessary for the survey inspector to check compliance of the scale for graduations and accuracy tolerances specified in §58.128m: "Compliance shall be determined by the appropriate regulatory authority." Usually this will be a state or local department of weights and measures which checks scales routinely. Deficiencies regarding scale graduations or accuracy tolerance will not be considered as a significant factor in the assignment of plant status. In the event that official test weighing is requested, it is required, of course, that a suitable accurate scale be provided as outlined in separate instructions for inspection, sampling, and test weighing of cheese. The inspector involved would be responsible for checking that the scale is suitable and accurate.

Item C52—Rindless Sealing Equipment (58.426).

Check a few finished blocks to determine whether the wrappers are tightly applied and adequately sealed. For wrappers using wax as a sealing agent (parakote, aluminum foil, etc.), the kraft outer wrapper is melted, causing the outer wrapper to have a mottled, greasy

appearance. Wrappers employing sealing techniques other than wax should be closely examined to determine if a complete seal is obtained.

As a general rule, only a cursory check need be made of the wrapping and sealing operation for rindless block cheese. It is not necessary to report type of wrapper, sealing temperature, sealing method, etc., unless to illustrate deficiencies in the procedures. When the cheese is being offered for grading it is the responsibility of the grader to check for proper wrapper application and sealing. However, when wrapping and sealing deficiencies are noted during the survey, recommend needed corrections.

Individual block sealing presses shall have square interior corners, reasonably smooth interior surface and have controls that provide uniform pressure and heat equally to all surfaces (the amount of pressure, heat, and time to be applied will vary considerably depending on the equipment and the kind of wrapping material used). If deficiencies are noted, recommend correction.

If the plant utilizes a machine that performs automatic wrapping of individual blocks, together with vacuumizing and sealing of the wrapper, check that the manual “unhooping” of the cheese and the feeding of the machine are performed in a sanitary manner.

When cheese is packed in cryovac bags and sealed by the heat shrink and bag clip method, check the hot water shrink tank and related equipment for condition and sanitation.

When cheese is to be paraffined, proper conditions should be maintained to produce a sound, dry rind on all surfaces of the cheese. This usually requires one or more days on the shelf with the cheese being turned once a day.

Drying of cheese on new clean scale boards on top of wood cheese boxes or box covers is satisfactory. However, the housekeeping and space requirements of this practice would make it suitable only for very small cheese operations.

When applicable, check that the carts and shelves used for drying the cheese are paraffined. They should be constructed of material that can be cleaned and maintained in a sanitary manner and free of mites. Recommend replacement of any deteriorated wooden shelves, standards, or carts. Wood construction in sound, clean condition is satisfactory.

If there is considerable volume of cheese for drying, a separate room shall be provided, of adequate size to accommodate the maximum production.

If the plant paraffins rind type cheese on the premises, use this item also to cover your inspection of the paraffining and boxing operations. When applicable because of the volume of cheese so handled, a separate room or compartment should be provided. Also check that the temperature of the room is maintained about the same as the drying room to avoid sweating of the cheese prior to paraffining.

The paraffin tank should be equipped with an indicating thermometer and facilities for automatic temperature control. Do not make recommendations about the temperature of the paraffin, this may vary considerably depending on the kind of paraffin and the manufacturer's advice in this regard.

Item C53—Housekeeping (58.126e, 58.127f, 58.146d).

See the guidelines for Item A7—Housekeeping.

Observe the general housekeeping in the packaging area. Packaging material and supplies should be kept off the floor and stored so as to preclude contamination of the materials. Supplies in the immediate packaging area should be maintained in a neat and orderly manner. Product contact material should be kept covered when not being used.

Item C54—Bulk Cheese Markings (58.438, 58.439, 58.445). Use of Antimycotics.

Use this item and the heading “Bulk Cheese Markings” or “Use of Antimycotics” to make recommendations about any noted deficiencies.

A. Bulk Cheese Markings.

Observe the markings present on the finished bulk packages. Bulk packages shall be legibly marked with the name of the product, name and address of manufacturer (or distributor) or state assigned plant identification, and vat number (although not required, it is industry practice to also show net weight on bulk cheese). When markings are satisfactory, no comments need be shown on the report.

When the cheese is marked as “pasteurized,” “made from pasteurized milk,” or words to that effect, follow the guidelines for Item C6.

The labeling requirements for raw milk or heat-treated milk cheese are found in 21 CFR 101.100 (f) (1), (2), and (3). Subsection (3) is for Cheddar, washed curd, Colby, and granular cheeses. It requires;

1. Each cheese shall bear a legible mark on the cheese showing the date at which the preliminary manufacturing process has been completed <u>and</u> at which date curing commences.

2. A removable tag shall be affixed to each cheese, wrapper or container containing the following:

   “_____ cheese made from unpasteurized milk. For completion of curing and proper labeling, or for labeling as _____ cheese for manufacturing.”

The blank being filled in with the applicable name of the variety of cheese.

B. Use of Antimycotics.

The FDA standards of identity in 21 CFR 133 subpart B list the ingredients that are allowed in each type of cheese. Many of these standards allow the use of antimycotics (mold inhibitors that are usually applied to the surface of the cheese). If antimycotics are used by the plant, use this item to list any deficiencies noted.

Antimycotics are allowed on the exterior of the following bulk cheeses for manufacturing or during curing and aging: Asiago, Blue, Brick, Edam, Gorgonzola, Gouda, Granular, Washed curd, Stirred curd, Hard grating cheeses, Monterey jack, Muenster, Parmesan, Romano, Swiss, and Soft ripened cheeses.

In addition to being allowed on the exterior, antimycotics can also be added during the kneading and stretching process of the following bulk cheeses: Mozzarella, Provolone, Scamorza.

The Standards of Identity allow the use of antimycotics on the surface of consumer slices, cuts, and packages of the following cheeses: Blue, Grated or shredded cheese (any variety), Cheddar, Colby, Cold pack, Greyer, Pasteurized process, Samsoe, Semisoft or Semisoft part skim, Spiced cheese. 21 CFR 172.155 was amended to allow the use of Natamycin (also known as pimaricin) on any cheese surface rather than limiting its use to consumer packages. This regulation is specific to natamycin and does not apply to any other antimycotic. In addition, §172.155(c) limits the amount that can be used to 20 milligrams per kilogram (20 ppm) in the finished product. Therefore, the use of Natamycin is acceptable on the surface of cheddar cheese regardless of the type of package.

Antimycotics are <u>not allowed</u> on the following cheeses: Cook cheese (Koch kaese), Cottage cheese, Cream cheese, Roquefort, and Sop sago, Skim milk cheese for manufacturing, and Bulk Colby.

If a plant is producing cheeses that do not have standards of identity (any type not listed) the use of antimycotics is allowed.

When the above guidelines are not being followed or if chlorine is being used as an antimycotic, recommend the practice be discontinued and assign the deficiency to category C.

Because these compounds are not dairy products, construction of the interior of the applicator does not need to meet dairy product contact requirements. However, the method used to apply the antimycotics shall protect the cheese from contamination. If a hand held sprayer is used it shall be stored between uses in an acceptable manner and be kept clean. Some plants may utilize a spray head powered by air under pressure. In this case the air shall meet the requirements of *3-A Accepted Practice for Supplying Air Under Pressure in Contact with Milk, Milk Products and Product Contact Surfaces, Number 604-* and if the spray head is mounted permanently in the dairy product zone it's exterior shall meet the requirements of a product

contact surface. The plant shall not use paint brushes, rags, sponges, paint rollers, or other applicators that cannot be kept sanitary.

Product Storage

Item C56—Room Construction - Coolers (58.126, 58.154, 58.412).

See the guidelines for Item B51—Room Construction - Coolers.

Check the floor for cleanliness. When large bulk style or fiber barrel cheese is stored more frequent cleaning of the floor may be required

Item C57—Room Construction - Warehouse (58.126, 58.153).

See the guidelines for Item B53—Room Construction - Warehouse.

Item C58—Lighting & Ventilation (58.126d, e, 58.412).

See the guidelines for Item B54—Lighting & Ventilation.

The guidelines for Item B54 also apply to coolers for fresh cheeses such as Cottage, Bakers, etc., and for drying, storage, and curing rooms for American or similar type cheese. Moldy conditions in such rooms are considered a serious deficiency.

Special temperature and high humidity conditions are required for curing of certain varieties of cheese. Although all other sections of B54 apply, moldy conditions will not have the same significance in the following situations:

A. Cheese Rooms Where Mold Growth is a Step of the Cheese Making Process.

Blue, Gorgonzola, Brie, and Camembert are examples of such types. These cheeses are mold covered upon completion of the curing process.

It is not unusual for some mold to grow on adjacent curing shelves. Under such conditions where the mold appears to be a desirable type for the particular cheese, its presence is not considered a deficiency. However, the walls, ceiling, and shelf supports should be free of mold.

B. Curing Rooms for Surface Ripening Cheese.

Some cheeses, such as Brick, Limburger, Liederkranz, Muenster, etc. require high humidity conditions to support the surface ripening characteristic of the cheese. But at the same time the high humidity is conducive to mold growth. However, the walls, ceiling, and shelf supports should be free of mold.

C. Long hold cheese curing rooms.

Parmesan cheese for instance is cured a minimum of 10 months and often up to 18 months. Romano is cured for not less than 5 months. These cheeses too, may become mold covered

during the long curing process and are then machine brushed and cleaned before final packaging. The mold is not essential to the cheese making process, but is not harmful, being only a surface growth due to hard rind condition. Mold development on the cheese is difficult to avoid because of the necessary cheese curing temperatures and the humidity range necessary to avoid excessive drying of the cheese and cracked rind condition. However, the walls, ceiling, and shelf supports should be free of mold.

Item C59—Temperature Control (58.412, 58.510d).

See the guidelines for Item B55—Temperature Control.

Item C60—Housekeeping (58.126e, 58.127f, 58.146d, 58.154).

See the guidelines for Item A7—Housekeeping.

When product and supplies are being stored on pallets or floor racks, check the item satisfactory (no comment needed). If product or supplies are stored on the floor make an appropriate recommendation. The floor under pallets or racks should be kept clean.

In the case of cheese in metal barrels and 640's, it is not necessary to use pallets provided the barrels are removed from the cooler regularly and the floor is maintained in a clean condition. More rapid and uniform cooling of barrel cheese is promoted by storage on slats or pallets, however, this practice is not a requirement.

Check that storage is orderly and good housekeeping is maintained.

General Items

See the guidelines for Page A — General Items.