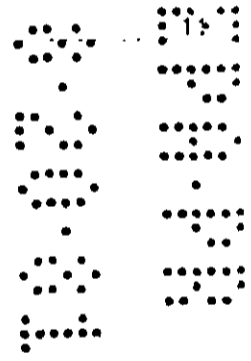




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DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling

DAIRY PLANTS

A. PLANT WATER SUPPLY

Problem

Due to location, many dairy plants are forced to provide their own potable water. Health authorities have directed much attention in recent years to the quality of such water supplies and the effect of water purity on the quality of the dairy product. As a result, an increasing number of plants find it necessary to disinfect their waste

Treatment

As a general rule the use of Magnum solutions for this purpose offers the simplest and most economical solution to water disinfection problems. A solution of sodium hypochlorite (usually 1% available chlorine, 10,000 ppm) is most commonly used. This solution can be easily prepared as follows. Stir 3½ lbs. of dry Magnum into a 30 gallon plastic container which is about ¼ full of warm water, then add 3 lbs. of light soda ash, stir thoroughly and dilute to 30 gallons. Add the 1% solution to water to obtain a free available chlorine residual of 0.2 ppm after 20 minutes contact time as measured by a test kit.

B. DAIRY PLANT SANITATION

Problem

Bacterial control in dairy processing plants has come to be recognized as essential if dairy product quality is to be maintained. Every surface coming in contact with the product must be not only physically clean but free of bacteria as well.

Treatment

Solutions containing the active ingredient in Magnum have long been recognized as one of the most economical and effective of dairy sanitizing agents. With the widespread use of stainless equipment in the dairy industry the use of Magnum solutions for plant sanitation is almost universal in acceptance by plant operators and health authorities alike. Due to the variety of uses (described below) for such hypochlorite solutions in and about the dairy plant, stock solutions of 1% available chlorine content (10,000 ppm) are usually kept on hand. Proper dilutions for specific uses are easily prepared by adding water to the required amount of stock solution.

Suggested applications for the Magnum stock solution in dairy plant practice are described briefly below along with the most generally recommended dilutions.

1 Dairy Plant Water Supply Disinfection

Use full strength 1% available chlorine Magnum stock solution as described in section (A) under Plant Water Supply.

2 Flow or Pressure Method of Sanitizing Equipment

This method is most commonly used for sanitizing closed systems such as fluid milk cooling and handling equipment. Units such as weigh tanks, coolers, short time pasteurizers, pumps, homogenizers, fillers, sanitary piping and fittings, bottle and can fillers, etc. are easily treated by this method.

(a) Thoroughly clean all equipment immediately after use. Assemble in operating position just before placing in service.

(b) Prepare a volume of sanitizing solution sufficient to completely fill all equipment to full capacity allowing a 10% excess for waste. Use 1 quart of 1% Magnum stock solution for each 12 gallons of water (approximately 200 ppm). Mix well in weigh tank or holding tank.

(c) Pump above solution through system until a full flow is obtained at all extremities so that system is entirely filled excluding all air. Close final drain valves and hold under pressure for 2 minutes to insure good contact with all surfaces. Follow by rinsing with potable water.

3 Spray or Fog Method of Sanitizing Equipment

This method is generally used for sanitizing large non-porous surfaces which have previously been freed of physical soil, such as batch pasteurizers, holding tanks, weigh tanks, tank trucks and cars, vats, tile walls, ceilings and floors, etc.

(a) Prepare spraying or fogging solution in required quantity by mixing 1 pint of 1% Magnum stock solution with each 6 gallons water used (approximately 200 ppm).

(b) Use pressure spraying or fogging equipment designed to resist hypochlorite solutions (plastic or rubber coated, stainless steel, etc.). Otherwise take care to empty and rinse spraying equipment well with fresh water immediately after using.

(c) Apply spray or fog heavily to all surfaces which product will touch, taking care to penetrate corners and turns and to thoroughly wet all treated surfaces with spray. Allow excess solution to drain off, then place in service.

4 Deodorizing and General Disinfection

(a) Magnum solutions are effective for odor control in refrigerated spaces, drain platforms and for general plant sanitation measures applied to floors, walls and ceilings.

(b) Using a solution consisting of one half gallon Magnum stock solution to each 5 gallons water (approximately 1000 ppm), flush or swab surfaces generously.



(c) After 2 minutes hose or rinse all metal surfaces with plain water.

5. Pails, Cans and Other Utensils

Following milking, rinse all utensils with cold water. Clean thoroughly with warm water and washing powder, rinse with water and drain. In accordance with local health regulations or your individual needs, sanitize all utensils just before milking by either of the following methods:

(a) Rinse Method

Prepare Magnum solution in required quantity by mixing 1 pint of 1% stock solution with each 6 gallons of water used (approximately 200 ppm). Pour solution from one pail to another, making sure that it comes in contact with entire inner surface of each pail. Invert pails on a rack and allow to drain.

From the last pail pour the solution into one of the milk cans, turn on its side and shake so the solution comes in contact with entire surface of the can and lid (strainer may be easily rinsed by placing on a can at the time the solution is poured into the can). Repeat rinsing operation for each can, then invert and allow to drain.

(b) Immersion Method

In an immersion tank, prepare a Magnum solution in accordance with local health regulations (see table).

Submerge pails, cans, strainers, etc. in the solution for the time required by local health regulations. Remove the items from the solution and allow to drain. Take out any solution required for other uses and then empty the immersion tank.

6. Milking Machines

Clean all parts thoroughly after use. Between milkings, keep tubes and teat cups filled with lye solution* on a solution rack, or keep immersed in a crock filled with lye solution*. If the crock method is used, the best practice is to make fresh solution each day.

Just before milking, drain the lye solution* from the teat cups and milk tubes. Rinse pail and head in 200 ppm Magnum solution, reassemble unit, draw about 2 gallons of the Magnum solution through the teat cups into the pail, then drain.

*Or any other sanitizing solution approved by local health authorities.

7. Coolers

In flushing surface coolers, use 100 to 200 ppm Magnum solution. The solution should be poured into the tank above the cooler and made to come in contact with the entire inside surface. Then open the spigot so that the solution may flow over the cooler and wet the entire cooling surface.

8. Cooling Tanks

To combat slime growths or other contamination in cooling tanks, add 1/2 teaspoon of Magnum for each 40 gallons of water in the tank. Repeat the treatment as often as necessary to clear up the slime condition.

9. Separator

Each day, after separating and while the separator is up to speed, flush with cold water. Disassemble and wash the separator parts with hot water and washing powder. Then scald with boiling water and set aside to dry.

When ready to again use the separator, reassemble the parts and while getting the separator up to speed, fill the bowl to not less than 1/3 of its capacity with 100 to 200 ppm Magnum solution. Flush the bowl and separator while it's running. Follow immediately with milk.

10. Sanitizing C-I-P Milk Lines

Thoroughly clean all C-I-P lines immediately after each milking. Just before the next use, circulate 200 ppm Magnum solution for at least ten minutes. Use enough of the solution to completely fill all lines in the system.

11. Control of Mold Growths and Mildew

Mold and mildew sometimes appear in cheese-aging rooms, storage rooms and other spaces. Magnum solutions are effective in destroying such growths (Non-residual).

(a) Brush or spray all walls, floors, ceilings, shelves, etc. with solution consisting of 1 quart 1% Magnum stock solution to each quart of water (5000 ppm).

(b) Rinse all metal surfaces immediately to avoid corrosion.

C. DAIRY PLANT WASTE TREATMENT

Problem

Regulating authorities are becoming increasingly concerned with stream pollution and waste disposal problems. Many dairy processing plants are finding it necessary to make provisions for suitable disinfection and odor control of plant wastes.

Treatment

Magnum, either in the dry form, dissolved in plain water, or as plant stock solutions, presents an economical means of treating dairy wastes without the necessity for large capital outlays. Treatment may be carried out either by continuous operation or in batch operations.

In the former method either an overflow type retention basin or a flume or outfall of sufficient length to provide required contact time and mixing must be provided. Application is by means of a hypochlorinator capable of feeding Magnum solutions in proportion to waste flow. The machine is usually located near the point at which the wastes

leave the plant building and the point of application is followed by baffles to insure agitation. Dosage rate is adjusted to provide 15-25 ppm available chlorine.

In the latter batch method a suitable means of impounding wastes is provided. Collected wastes are then treated by addition of dry Magnum solutions to produce a residual of 15-25 ppm.

POULTRY HOUSES

The problem of odor control in poultry houses is not completely solved by normal cleaning practices. The regular use of an efficient bactericide and deodorant is strongly recommended and often required by health authorities.

A. Poultry houses including feeding space, dropping boards, feeding troughs and watering fountains should be cleaned and treated regularly with a solution containing 1 oz. Magnum for every gallon of water, as follows:

Spray or flush the solution generously on all surfaces and equipment. Use the solution to rinse all watering fountains before they are returned to service.

B. Treat poultry drinking water to a dosage of 1-5 ppm available chlorine by either gravity feeding into a float control fountain or by feeding it batchwise into refillable type fountains.

CROP PROTECTION

Magnum can be used to make aqueous solutions of varying concentrations which can be used to control bacterial and fungal contamination.

A. To help control bacterial blotch (*Pseudomonas tolosarii*) of mushrooms:

1. Use a Magnum solution having an available chlorine level of 100-200 ppm prior to watering mushroom production surfaces. The first application of chlorinated water should begin when pins form, and thereafter, between breaks on a need basis depending on the occurrence of bacterial blotch.

2. Magnum may be used directly as a powder for local applications to control small infection foci (local concentrations of disease). Apply 1.5-2 oz. (40-60 grams) dry weight per square foot of growing space.

POST HARVEST CROP PROTECTION

Magnum can be used to make aqueous solutions of varying concentrations which can be used to control post-harvest contamination of vegetables and fruits.

A. To help control and reduce the spread of soft rot causing organisms in harvested potatoes.

Prepare a solution containing 500 ppm available chlorine by mixing 0.5 oz. of Magnum with 5 gallons of water. Spray 1 gallon of this solution over each ton of unwashed tubers entering storage on a conveyor line. Provide tumbling action during treatment.

B. To help control and reduce the spread of soft rot causing organisms on harvested sweet potatoes:

1. Prepare a solution containing 150-500 ppm available chlorine by dissolving 3-10 ounces of Magnum in 100 gallons of water.
2. Dip or spray the sweet potatoes.
3. Monitor the available chlorine level on an hourly basis and add Magnum to the solution as necessary to maintain the proper chlorine concentration; or, change the solution after using one hour, or as needed.

C. Vegetable washing:

1. Remove surface soil and debris by washing in a wash tank.
2. After draining, submerge in a second wash water tank for 2 minutes where wash water containing 25 ppm available chlorine is recirculated.
3. After washing in chlorinated water, spray rinse with water containing 25 ppm available chlorine and then package.

D. Fruit washing:

Disinfection treatments with solutions containing Magnum have been found to be beneficial in reducing harmful bacteria accumulations and in improving the keeping qualities of fruit.

1. Soak fruit for 2 minutes in a solution containing 25 ppm available chlorine. The solution is prepared by adding 1/4 oz. Magnum to 50 gallons of water.
2. After treatment, rinse the fruit with potable water.

E. Pecan Cracking and Dyeing:

Magnum has been found beneficial in reducing bacteria by soaking the pecans in Magnum-treated water prior to cracking and shelling. Magnum solutions are also used for the bleaching of pecan shells prior to dyeing of the shells.

1. Soaking of Pecans to be Cracked and Shelled—prepare pecan-soaking solution by adding 1 oz. of Magnum for each 5 gallons of water (1000 ppm). Permit pecans to remain in this mixture for a minimum of 10 minutes. After removal, the pecans are aged for about 24 hours. This permits more uniform cracking and greater softening of the pecan meat, thereby increasing the opportunity for whole nut removal. The penetrating effect of the chlorine solution acts to destroy bacteria but does not in any way affect the taste of the nut.
2. Bleaching and Dyeing of Whole Pecans—before bleaching, pecans are placed in a rotary cleaner where they are washed.

drained and soaked in a 2% sulphuric acid bath at a temperature of 80° to 90° F for a period of 1 minute. They are then transferred to Magnum solution which contains 6 1/2 lbs. Magnum for each 100 gallons of water (about 5000 ppm)

The bleaching period lasts usually from 4 to 8 minutes. After the pecans are satisfactorily whitened, they are drained and washed in a 1% sulphuric bath at a temperature of 80° to 90° F. They are then dried and ready to be dyed

AQUACULTURE

Magnum can be used to kill many bacteria and to control the growth of algae.

A To control the growth of algae and kill bacteria in fish ponds.

1. Remove all fish from the pond.
2. Scatter Magnum over the fish pond at a rate of 1 ounce per 500 gallons of water. After 5 minutes, test for the available chlorine level, using a pool test kit. If the available chlorine level in any part of the pool is below 1 ppm, repeat the dosage until 1 ppm is attained. Allow the pond to remain empty of fish until the chlorine residual drops to 0 in all parts of the pond.

Magnum, even in minute quantities, is toxic to fish, as are all hypochlorites.

B To sanitize fish tanks, raceways and utensils.

1. Clean thoroughly with soap and water to remove scum and dirt.
2. Apply Magnum to tanks and raceways that have been filled with water. Use enough Magnum to provide an available chlorine level of 200 ppm. For equipment such as nets, soak for one hour in a Magnum solution having an available chlorine level of 200 ppm.

C To disinfect marine lobster ponds

1. Remove all lobsters from the pond. At ebb tide, open the gates to permit draining of the pond.
2. Remove all seaweed, lobster parts and feed fragments.
3. Using gloves or clean, dry utensils, broadcast Magnum over the exposed mud and silt surfaces at approximately 1/4 ounce to every 2 square feet, making sure that every empty barrow receives some granules.
4. At dead low tide, place a clean, dry empty drum with 1/4 inch holes drilled in the bottom half in the shallow pool of water in front of the gates. Add 2-3 two gal. pails of Magnum to the drum, using a clean, dry pail. Wearing goggles and rubber gloves, after all of the Magnum is dissolved, place the suction end of a hose attached to a high pressure pump into the drum, then spray the chlorinated water on the face of the dam, gates and rocks to re-

move the slime and green algae. After this operation, remove all equipment and open gates to allow incoming tide water to flush all treated surfaces and dilute the Magnum residual.

5. When the tidal high water level is reached, close the gates for 2 to 3 days to allow the residual available chlorine to be used up.
6. Test the water with a suitable test kit to insure that the available chlorine level has dropped to 0 in all parts of the pool. Open the gates and allow the tide to flush the pond for at least 2 cycles to remove debris and dead algae. The gates may now be closed and the pond re-used to store lobsters.

Magnum, like all hypochlorites even in minute quantities, is toxic to fish or lobsters.

Approximate pounds of Magnum required to treat ponds of varying sizes (pond surface in square feet).

Sq Ft Pond Surface	10,000	20,000	50,000	100,000	200,000	400,000
Lbs Magnum	78	156	390	780	1,560	3,120

D. Conditioning of live oysters to reduce bacterial level.

1. Water-tight tanks are filled and the water treated with Magnum to achieve an available chlorine level of 0.5 ppm.
2. Maintain the water temperature between 50° and 70° F to prevent closure of the oyster shell and failure to self-purify.
3. Place the oysters in the tank for at least 15 minutes. Test periodically to make certain that the available chlorine level does not fall below 0.05 ppm at any time during the treatment period. If this level is not attained, the entire application must be repeated. The reduction of bacterial levels depends primarily on self-purification and is accomplished by the flow of the cloacal current through the oyster. The presence of excessive free available chlorine or a water temperature below 50° F will cause closure of the oyster shell and subsequent stoppage of the cloacal current.

LEAFCUTTING BEE CELLS AND EQUIPMENT

A Disinfection of leafcutting bee cells and equipment for chalkbrood control

1. Work outdoors in a well ventilated room.
2. To disinfect leafcutting bee cells, place them into a 1/4 inch mesh screen wire dipping basket with a lid. Submerge the dipping basket, with bee cells, into a 2.5% solution of Magnum for 3 minutes. Gently agitate the basket up and down to displace entrapped air bubbles. Remove the dipping basket and bee cells from the solution and let drain for 2 minutes. Place the drained

bee cells on a 1/8 inch mesh screen wire rack to dry. The rack should be elevated in a shaded, well ventilated area away from direct sunlight. Allow the leafcutting bee cells to dry for 4 or 5 hours until no chlorine odor can be detected.

- 3 To disinfect bee boards, submerge them in the 2.5% Magnum solution for 3 minutes. Drain and set out to dry. When dipping, be sure that the holes are facing up and when draining, the holes are facing down. Dry the boards thoroughly until no chlorine odor is detectable before placing in the domicile.
- 4 To disinfect the domicile, spray with a 1% solution of Magnum until the surfaces are thoroughly wet (to the point of dripping). Allow to dry before replacing the bee boards.

SEED TREATMENTS

A To help control bacterial spot (*Xanthomonas vesicatoris*) on pepper seeds

1. Prepare a solution containing 3.9% available chlorine.
2. Remove moist seeds from ripe fruits and soak seeds immediately in this solution for 15 minutes with continuous agitation (add 1 gallon of seeds to 3 gallons of solution).
3. After soaking, rinse the seeds in potable water for 15 minutes and dry to a 6% moisture content.
4. Prepare a fresh solution for each batch of seeds.
5. Do not use treated seeds for food or feed.

MAGNUM SOLUTION CHART

Available Chlorine	Gallons of Water					
	10	50	100	500	1000	
1 ppm	-	0.01 oz	0.02 oz	0.1 oz	0.2 oz	
5 ppm	-	0.1 oz	0.2 oz	0.51 oz	1.03 ozs	
25 ppm	-	0.26 oz	0.51 oz	2.56 ozs	5.14 ozs	
50 ppm	0.1 oz	0.5 oz	1 oz	5 ozs	10 ozs	
100 ppm	0.2 oz	1 oz	2 ozs	10 ozs	1 lb 4 ozs	
100.5 ppm	0.3 oz	1.5 ozs	3 ozs	15 ozs	1 lb 14 ozs	
102 ppm	0.4 oz	2 ozs	4 ozs	1 lb 5 ozs	2 lbs 8 ozs	
102.5 ppm	0.5 oz	2.5 ozs	5 ozs	1 lb 10 ozs	3 lbs 3 ozs	
105 ppm	1 oz	5 ozs	10 ozs	3 lbs 4 ozs	6 lbs 6 ozs	
0.1	1000	2 ozs	10 ozs	1 lb 4 ozs	6 lbs 8 ozs	
10	10000	1 lb 5 ozs	6 lbs 7 ozs	12 lbs 13 ozs		
15	15000	1 lb 15 ozs	9 lbs 10 ozs	19 lbs 4 ozs		
20	20000	2 lbs 9 ozs	12 lbs 9 ozs	25 lbs 1 oz		
25	25000	3 lbs 3 ozs	16 lbs	32 lbs		
19	30000	5 lbs	25 lbs	50 lbs		

FIGURING TANK CAPACITIES

To figure the gallon capacity of a rectangular or square tank, multiply the length times the width times the depth (all in terms of inches, inside dimensions) times .0043. Example--Find the gallon capacity of a tank measuring 60 in long by 40 in wide by 48 in deep

$$\text{Length} \times \text{Width} \times \text{Depth (all in inches)} \times .0043 = \text{Capacity in U.S. Gallons}$$

$$60 \times 40 \times 48 \times .0043 = 495.36 \text{ U.S. Gallons}$$

Capacity of Cylindrical Tanks

To figure the gallon capacity of a cylindrical tank, measure the diameter and depth of the tank in inches, then multiply the diameter times the diameter times the depth (all in terms of inches, inside dimensions) times .0034. Example--Find the gallon capacity of a tank measuring 60 in. in diameter by 72 in. in depth.

$$\text{Diameter} \times \text{Diameter} \times \text{Depth} \times .0034 = \text{Capacity in U.S. Gallons}$$

$$60 \times 60 \times 72 \times .0034 = 881.28 \text{ U.S. Gallons}$$

Working Capacity of Tanks

In figuring the capacity of any tank, it should be borne in mind that the working capacity will be somewhat less than the actual calculated capacity.

Magnum Granular should never be mixed with anything but water.

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Danger, highly corrosive. Causes skin and eye damage. May be fatal if swallowed. Do not get in eyes, on skin, or on clothing. Do not handle with bare hands. Wear goggles or face shield and use rubber gloves or only thoroughly clean, dry utensils when handling. Irritating to nose and throat. Avoid breathing dust and fumes. Remove and wash contaminated clothing before reuse.

STATEMENT OF PRACTICAL TREATMENT

(First Aid Procedures)

IF ON SKIN: Brush off excess chemical and flush skin with cold water for at least 15 minutes. If irritation persists, get medical attention.

IF INHALED: Remove person to fresh air. Get immediate medical attention.

IF IN EYES: Flush with cold water for at least 15 minutes. Get immediate medical attention.

IF SWALLOWED: Give bread soaked in milk, followed by large amounts of water. If person is conscious and vomiting, place face down with head lower than hips. Get immediate medical attention.

ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not contaminate lakes, ponds, or streams by cleaning of equipment or disposal of wastes.

PHYSICAL OR CHEMICAL HAZARDS

Danger, strong oxidizing agent. Mix only into water. Contamination may start a chemical reaction with generation of heat, liberation of hazardous gases, and possible fires and explosion. Avoid any contact with flame or burning material, such as lighted cigarette. Do not contaminate with moisture, garbage, dirt, organic matter, chemicals, including other chlorinating compounds, household products, soap products, paint products, solvents, acids, vinegar, beverages, oils, pine oil, dirty rags or any other foreign matter. Do not use moist or damp utensils.

STORAGE AND DISPOSAL

Keep product dry in tightly closed container when not in use. Store in a cool, dry, well-ventilated area away from heat or open flame. Do not reuse empty container. Rinse empty container thoroughly with water to dissolve all material before discarding. Place in trash collection or dispose in approved landfill area or bury in a safe place. EMERGENCY HANDLING: In case of contamination or decomposition, do not reseal container. If possible, isolate container in open and well-ventilated area. Flood with large volumes of water.

Supplemental Labeling



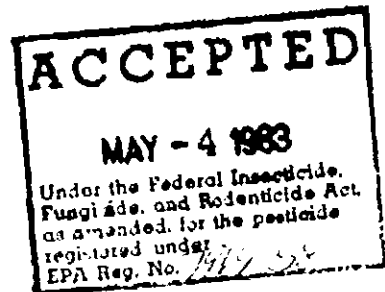
Label 1011
EPA Reg. No. 7969-2

Poast[®]

herbicide

For use in Ornamental, Nursery, and Other Non-Food Crops.

Not intended for domestic use, except by professional applicators.



Poast (EPA Reg. No. 7969-2)

All applicable directions, restrictions, precautions and Conditions of Sale and Warranty on the EPA-registered label are to be followed. This labeling must be in the possession of the user at the time of herbicide application.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

GENERAL INFORMATION

Poast[®] is a selective broad spectrum postemergence herbicide for control of annual and perennial grass weeds in many non-food plants and crops. Poast does not control sedges or broadleaf weeds.

Many seedling, newly transplanted and established non-grassy ornamentals, trees, shrubs, and ground covers are tolerant to Poast. Very slight leaf speckling has been observed on a few species with no reduction in vigor or growth.

Since all grass crops such as sorghum, corn, small grains, and rice as well as ornamental grasses such as turf, are extremely susceptible to Poast, avoid all direct or indirect contact with any desired grass plant.

Control Symptoms: Poast rapidly enters the plant through the foliage and translocates throughout the plant. Control symptoms exhibited by the grass plant progress from a slowing or stopping of growth (generally within 2 days), to reddening of the foliage, and to leaf tip burn. Subsequently, burn back of the foliage occurs. These symptoms will generally be observed within three weeks depending on environmental conditions.



P.O. Box 991
Little Rock, Arkansas

ACCEPTED
1208-1028
SEP 30 1981
Under the Federal Insecticide, Fungicide, and Rodenticide Act, amended, for the purpose of registration under the FIFRA Act.

Magnum

agricultural chlorinator

Active Ingredient Calcium Hypochlorite	65
Inert Ingredients	35
*Available Chlorine	65

KEEP OUT OF REACH OF CHILDREN
DANGER
CONTAMINATION MAY CAUSE FIRE.
MIX ONLY INTO WATER.
SEE PRECAUTIONARY STATEMENTS AND
FIRST AID INFORMATION ON PAGE 11

EPA Reg. No. 1208-1028

DIRECTIONS FOR USE

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DAIRY PLANTS

A PLANT WATER SUPPLY

Problem

Due to location many dairy plants are forced to provide their own potable water. Health authorities have directed much attention in recent years to the quality of such water supplies and the effect of water purity on the quality of the dairy product. As a result an increasing number of plants find it necessary to disinfect their water.

Treatment

As a general rule the use of Magnum solutions for this purpose offers the simplest and most economical solution to water disinfection problems. A solution of sodium hypochlorite (usually 1% available chlorine) (100 ppm) is most commonly used. This solution can be easily prepared as follows: Stir 3 lbs. of dry Magnum into a 30 gallon plastic container which is at least half full of water. Then add 3 lbs. of light soda ash to the mixture and dilute to 90 gallons. Add the 1% solution to water to obtain a free available chlorine residual of 0.2 ppm after 20 minutes contact time as measured by a test kit.

B DAIRY PLANT SANITATION

Problem

Health authorities have directed much attention in recent years to the quality of dairy products. As a result an increasing number of plants find it necessary to disinfect their water.

Treatment

As a general rule the use of Magnum solutions for this purpose offers the simplest and most economical solution to water disinfection problems. A solution of sodium hypochlorite (usually 1% available chlorine) (100 ppm) is most commonly used. This solution can be easily prepared as follows: Stir 3 lbs. of dry Magnum into a 30 gallon plastic container which is at least half full of water. Then add 3 lbs. of light soda ash to the mixture and dilute to 90 gallons. Add the 1% solution to water to obtain a free available chlorine residual of 0.2 ppm after 20 minutes contact time as measured by a test kit.

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1 Dairy Plant Water Supply Disinfection

Use full strength 1% available chlorine Magnum stock solution as described in section (A) under Plant Water Supply.

2 Flow or Pressure Method of Sanitizing Equipment

This method is most commonly used for sanitizing closed systems such as fluid milk cooling and handling equipment. Units such as weigh tanks, coolers, short time pasteurizers, pumps, homogenizers, fillers, sanitary piping and fittings, bottle and can fillers, etc. are easily treated by this method.

(a) Thoroughly clean all equipment immediately after use. Assemble in operating position just before placing in service.

(b) Prepare a volume of sanitizing solution sufficient to completely fill all equipment to full capacity allowing a 10% excess for waste. Use 1 quart of 1% Magnum stock solution for each 12 gallons of water (approximately 200 ppm). Mix well in weigh tank or holding tank.

(c) Pump above solution through system until a full flow is obtained at all extremities so that system is entirely filled excluding all air. Close final drain valves and hold under pressure for 2 minutes to insure good contact with all surfaces. Follow by rinsing with potable water.

3 Spray or Fog Method of Sanitizing Equipment

This method is generally used for sanitizing large non-porous surfaces which have previously been freed of physical soil, such as batch pasteurizers, holding tanks, weigh tanks, tank trucks, etc., cars, vats, tile walls, ceilings and floors, etc.

(a) Prepare spraying or fogging solution in required quantity by mixing 1 part of 1% Magnum stock solution with each 6 gallons of water (approximately 200 ppm).

(b) Use proper spraying or fogging equipment (designed to resist hypochlorite solutions, plastic or rubber coated, stainless steel, etc.). Otherwise take care to empty and rinse spraying equipment well with fresh water immediately after using.

(c) Apply spray or fog heavily to all surfaces which product will touch, taking care to penetrate corners and turns and to thoroughly wet all treated surfaces with spray. Allow excess solution to drain off, then place in service.

4 Use of Fogging for General Disinfection

(a) Magnum solutions are effective for odor control in refrigerated spaces, drain platforms and for general plant sanitation measures applied to floors, walls and ceilings.

(b) To prepare a disinfectant fog of one-half gallon Magnum stock solution, mix one-half gallon of water (approximately 100 ppm) with one gallon of Magnum.

BEST DOCUMENT AVAILABLE

(c) After 2 minutes hose or rinse all metal surfaces with plain water.

Pails, Cans and Other Utensils
 Following milking, rinse all utensils with cold water. Clean thoroughly with warm water and washing powder, rinse with water and drain in accordance with local health regulations, or your individual needs. Sanitize all utensils just before milking by either of the following methods:

(a) **Rinse Method**
 Prepare Magnum solution in required quantity by mixing 1 pint of 1% stock solution with each 6 gallons of water used (approximately 200 ppm). Pour solution from one pail to another, making sure that it comes in contact with entire inner surface of each pail. Invert pails on a rack and allow to drain.

From the last pail pour the solution into one of the milk cans, turn on its side and shake so the solution comes in contact with entire surface of the can and lid (strainer may be easily removed by placing on a can at the time the solution is poured into the can). Repeat rinsing operation for each can. Then invert and allow to drain.

(b) **Immersion Method**
 In an immersion tank, prepare a Magnum solution in accordance with local health regulations (see table).

Submerge pails, cans, and other utensils in the solution after the latter is prepared by local health regulations. For milk cans, immerse them in the solution and allow to drain. Use only any solution required for other uses and then empty the immersion tank.

Measuring Lines
 A team of ants that roams all night between the two peaks contributes to the ant colony. It is not a simple matter to find a team of ants that will go to a certain place for a certain time. It is not a simple matter to find a team of ants that will go to a certain place for a certain time.

After milking, draw the lines down from the heat cups and the tubes. Rinse pails and tubes with 200 ppm Magnum solution. Repeat rinsing operation for pails and tubes. Rinse with plain water.

After milking, draw the lines down from the heat cups and the tubes. Rinse pails and tubes with 200 ppm Magnum solution. Repeat rinsing operation for pails and tubes. Rinse with plain water.

8 Cooling Tanks
 To combat slime growths or other contamination in cooling tanks, add 1/2 teaspoon of Magnum for each 40 gallons of water in the tank. Repeat the treatment as often as necessary to clear up the slime condition.

9 Separators
 Each day after separating and while the separator is up to speed, flush with cold water. Disassemble and wash the separator parts with hot water and washing powder. Then scald with boiling water and set aside to dry.

When ready to again use the separator, reassemble the parts and while getting the separator up to speed, fill the bowl to not less than 7/8 of its capacity with 100 to 200 ppm Magnum solution. Flush the bowl and separator while it's running. Follow immediately with milk.

10 Sanitizing CIP Milk Lines
 Thoroughly clean all CIP lines immediately after each milking. Just before the next use, circulate 200 ppm Magnum solution for at least ten minutes. Use enough of the solution to completely fill all lines in the system.

11 Control of Mold Growths and Mildew
 Mold and mildew sometimes appear in cheese-aging rooms, storage rooms and other spaces. Magnum solutions are effective in destroying such growths (Non residual).

(a) Brush or spray all walls, floors, ceilings, shelves, etc. with solution consisting of 1 quart 1% Magnum stock solution to each quart of water (5000 ppm).

(b) Rinse all metal surfaces immediately to avoid corrosion.

C DAIRY PLANT WASTE TREATMENT

Problem
 Regulating authorities are becoming increasingly concerned with stream pollution and waste disposal problems. Many dairy processing plants are finding it necessary to make provisions for suitable disinfection and disposal of plant wastes.

Treatment
 Magnum solution, either in the dry form, dissolved in plain water, or as plant stock solution, presents an economical means of treating dairy wastes without the necessity for large capital outlays. Treatment may be carried out either by continuous operation or in batch operations.

In the former case, the liquid waste can be held in a retention basin or a flume, or it can be pumped to a large pipe to be pumped into a tank and then treated by the process. Application may be made by means of a hypochlorinator capable of feeding Magnum solutions in proportion to waste flow. The machine is usually located near the point at which the wastes

leave the plant building and the point of application is followed by baffles to insure agitation. Dosage rate is adjusted to provide 15-25 ppm available chlorine.

In the latter batch method a suitable means of impounding wastes is provided. Collected wastes are then treated by addition of dry Magnum solutions to produce a residual of 15-25 ppm.

POULTRY HOUSES

The problem of odor control in poultry houses can be largely solved by normal cleaning practices. The regular use of an efficient detergent and deodorant is strongly recommended and often required by health authorities.

A. Poultry houses including feeding space, dropping boards, feeding troughs and watering fountains should be cleaned and treated regularly with a solution containing 1 oz. Magnum for every gallon of water, as follows:

Spray or flush the solution generously on all surfaces and equipment. Use the solution to rinse all watering fountains before they are returned to service.

B. Treat poultry drinking water to a dosage of 1.5 ppm available chlorine by either gravity feeding into a float controlled siphon or by feeding of water into reliable type fountains.

CROP PROTECTION

Magnum can be used to make a pecan solution of varying concentration which may be used to control bacterial and fungal contamination of the crop. The bactericidal and fungicidal activity of the solution is dependent on the concentration of the solution and the time of application.

1. Use a 2% Magnum solution for control of bacterial contamination of the crop. This is prepared by watering that amount of Magnum solution on the crop which will produce a residual of 25 ppm available chlorine.

2. For control of fungal contamination of the crop, use a 1% Magnum solution. This is prepared by watering that amount of Magnum solution on the crop which will produce a residual of 15 ppm available chlorine.

3. For control of bacterial and fungal contamination of the crop, use a 1% Magnum solution. This is prepared by watering that amount of Magnum solution on the crop which will produce a residual of 15 ppm available chlorine.

POST HARVEST CROP PROTECTION

Magnum can be used to protect pecans from bacterial and fungal contamination after harvest. The solution is prepared by adding 1 oz. of Magnum to 5 gallons of water to produce a residual of 25 ppm available chlorine.

A. For control of bacterial contamination of the crop, use a 1% Magnum solution. This is prepared by watering that amount of Magnum solution on the crop which will produce a residual of 15 ppm available chlorine.

Prepare a solution containing 500 ppm available chlorine by mixing 0.5 oz. of Magnum with 5 gallons of water. Spray 1 gallon of this solution over each ton of unwashed tubers entering storage on a conveyor line. Provide tumbling action during treatment.

B. To help control and reduce the spread of soft rot causing organisms on harvested sweet potatoes:

1. Prepare a solution containing 150-500 ppm available chlorine by dissolving 3-10 ounces of Magnum in 100 gallons of water.

2. Dip or spray the sweet potatoes.

3. Monitor the available chlorine level on an hourly basis and add Magnum to the solution as necessary to maintain the proper chlorine concentration, or, change the solution after using one hour or as needed.

C. Vegetable washing

1. Remove surface soil and debris by washing in a wash tank.

2. After draining, submerge in a second wash water tank for 2 minutes where wash water containing 25 ppm available chlorine is recirculated.

3. After washing in chlorinated water, spray rinse with water containing 25 ppm available chlorine and then package.

D. Fruit washing

Disinfection treatments with solutions containing Magnum have been found to be beneficial in reducing harmful bacteria concentrations and in improving the keeping qualities of fruit.

1. Soak fruit for 2 minutes in a solution containing 25 ppm available chlorine. The solution is prepared by adding 1/2 oz. Magnum to 5 gallons of water.

2. After treatment, rinse the fruit with potable water.

E. Pecan Cracking and Dyeing

Magnum has been found beneficial in reducing bacteria by soaking the pecans in Magnum treated water prior to cracking and shelling. Magnum solutions are also used for the bleaching of pecan shells prior to dyeing of the shells.

A. Cracking of Pecans to be Cracked and Shelled - Prepare pecan cracking solution by adding 1 oz. of Magnum for each 5 gallons of water (25 ppm). Insert pecans to remain in this mixture for a minimum of 10 minutes. After removal, the pecans are aged for about 24 hours. This permits more uniform cracking and greater softening of the pecan meat, thereby increasing the opportunity for whole nut removal. The penetrating effect of the chlorine solution is to kill bacteria and fungi that would otherwise affect the taste of the nut.

B. Bleaching and Dyeing of Whole Pecans - Before bleaching pecans are placed in a rotary cleaner where they are washed

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drained and soaked in a 1% sulphuric acid bath at a temperature of 80° to 90° F. for a period of 1 minute. They are then transferred to Magnum solution which contains 6 1/2 lbs. Magnum for each 100 gallons of water (about 1.00 ppm).

The bleaching period lasts usually from 4 to 8 minutes. After the pecans are satisfactorily whitened, they are drained and washed in a 1% sulphuric bath at a temperature of 80° to 90° F. They are then dried and ready to be dyed.

AQUACULTURE

Magnum can be used to kill many bacteria and to control the growth of algae.

A. To control the growth of algae and kill bacteria in fish ponds

1. Remove all fish from the pond.
2. Scatter Magnum over the fish pond at a rate of 1 ounce per 500 gallons of water. After 5 minutes, test for the available chlorine level using a pool test kit. If the available chlorine level in any part of the pool is below 1 ppm, repeat the dosage until 1 ppm is attained. Allow the pond to remain empty of fish until the chlorine residual drops to 0 in all parts of the pond.

Magnum, even in minute quantities, is toxic to fish, as are all hypochlorites.

B. To clean fish tanks, raceways, and utensils

1. Clean thoroughly with soap and water to remove scum and dirt.
2. Apply Magnum to tanks and raceways that have been filled with water. Use enough Magnum to provide an available chlorine level of 20 ppm. For equipment that merely soaks for one hour, a 1% solution of bleach may be used. The available chlorine level should be 1 ppm.
3. Rinse thoroughly with clean water.
4. Remove all fish from the pond. At 6:00 P.M. open the gates to permit draining of the pond.
5. Remove all seaweed, filter parts, and food fragments.
6. Dump doses of chlorine directly into 500 gal. Magnum over the pond. The total available chlorine should be approximately 20 ppm. The chlorine level should be tested every 24 hours until the available chlorine level is 1 ppm.
7. At 6:00 A.M. the next day, drain the pond with a siphon or direct in the bottom siphon the entire amount of water in front of the gates. Add 1/2 ounce per 500 gal. of Magnum to the drain using a siphon. The drain should be kept open until the chlorine level of the Magnum is 1 ppm. The chlorine level should be tested every 24 hours until the available chlorine level is 1 ppm. The remaining water in the drain should be drained to the

move the slime and green algae. After this operation, remove all equipment and open gates to allow incoming tide water to flush all treated surfaces and dilute the Magnum residual.

5. When the tidal high water level is reached, close the gates for 2 to 3 days to allow the residual available chlorine to be used up.
6. Test the water with a suitable test kit to insure that the available chlorine level has dropped to 0 in all parts of the pool. Open the gates and allow the tide to flush the pond for at least 2 cycles to remove debris and dead algae. The gates may now be closed and the pond re-used to store lobsters.

Magnum, like all hypochlorites even in minute quantities, is toxic to fish or lobsters.

Approximate pounds of Magnum required to treat ponds of varying sizes (pond surface in square feet)

50 Ft. Pond Surface	10,000	20,000	50,000	100,000	200,000	400,000
Magnum Lbs.	78	156	390	780	1,560	3,120

D. Conditioning of live oysters to reduce bacterial level

1. Water tight tanks are filled and the water treated with Magnum to a base of an available chlorine level of 0.5 ppm.
2. Maintain the water temperature between 50° and 70° F. to break the surface of the oyster shell and failure to self-purify.
3. Place the oysters in the tank for at least 15 minutes. Test periodically to make certain that the available chlorine level does not fall below 0.05 ppm at any time during the treatment period. If the level is not attained, the entire application must be repeated. The residual chlorine level depends primarily on self-purification and is also controlled by the flow of the tidal current through the oyster. The presence of excessive free available chlorine or a water temperature below 50° F. will cause closure of the oyster shell and subsequent stoppage of the local current.

LEAF-CUTTING BEE CELLS AND EQUIPMENT

1. Wash the leaf-cutting bee cells and equipment for 24 hours in a well-ventilated room.
2. To sterilize leaf-cutting bee cells, place them into a 1/2 inch mesh green wire dipping basket with a lid. Submerge the dipping basket with cells only into a 2% solution of Magnum for 3 minutes, gently agitate the basket up and down to displace the trapped air bubbles. Remove the dipping basket and bee cells from the solution and drain for 2 minutes. Place the drained

bee cells on a 1/2 inch mesh screen wire rack to dry. The rack should be elevated in a shaded, well-ventilated area away from direct sunlight. Allow the leaf-cutting bee cells to dry for 4 or 5 hours until no chlorine odor can be detected.

3. To disinfect paper boards, submerge them in the 2.5% Magnum solution for 3 minutes. Drain and set out to dry. When dipping, be sure that the holes are facing up and when draining, the holes are facing down. Dry the boards thoroughly until no chlorine odor is detectable before placing in the incubator.

4. To disinfect the dome, spray with a 1% solution of Magnum onto the surface and allow to dry. Wipe the point of dipper. Allow to dry before replacing the Lee boards.

SEED TREATMENTS

2. To help control fly larvae, use efficient, well-aerated, deep peat soil.

3. For paper seed treatments, starting 4 or 5 days before the normal emergence time, immerse paper seed boards immediately in the solution for 15 minutes with continuous agitation. Add 1 cup of seeds to 3 gallons of solution.

4. To seed treat in the incubator, agitate in water for 15 minutes and dry to prevent mold growth.

5. To seed treat in the incubator, agitate in water for 15 minutes.

6. To seed treat in the incubator, agitate in water for 15 minutes.

MAGNUM SOLUTION CHART

100% 100%

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FIGURING TANK CAPACITIES

To figure the gallon capacity of a rectangular or square tank, multiply the length times the width times the depth (all in terms of inches, inside dimensions) times .0043. Example-- Find the gallon capacity of a tank measuring 60 in. long by 40 in. wide by 48 in. deep.

$$\text{Length} \times \text{Width} \times \text{Depth (all in inches)} \times .0043 = \text{Capacity in U.S. Gallons}$$

$$60 \times 40 \times 48 \times .0043 = 495.36 \text{ U.S. Gallons}$$

Capacity of Cylindrical Tanks

To figure the gallon capacity of a cylindrical tank, measure the diameter and depth of the tank in inches, then multiply the diameter times the diameter times the depth (all in terms of inches, inside dimensions) times .0034. Example-- Find the gallon capacity of a tank measuring 60 in. in diameter by 72 in. in depth.

$$\text{Diameter} \times \text{Diameter} \times \text{Depth} \times .0034 = \text{Capacity in U.S. Gallons}$$

$$60 \times 60 \times 72 \times .0034 = 861.28 \text{ U.S. Gallons}$$

Working Capacity of Tanks

In figuring the capacity of any tank, it should be borne in mind that the working capacity will be somewhat less than the actual calculated capacity.

Magnum Granular should never be mixed with anything but water.

