

8. APPROVED DISINFECTANTS FOR FMD VIRUS

In the U.S., the Environmental Protection Agency (EPA) regulates disinfectants (referred to as antimicrobial pesticides) under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). This law requires that all label use directions and safety precautions be followed. The labeling for each EPA-registered disinfectant lists the disease agents it effectively inactivates. In the case of the foot and mouth disease (FMD) virus, there are only a few labeled products and only one is registered as a sanitizer on food contact surfaces. In emergencies, when EPA registered products may not be available, EPA may grant exemptions for unregistered uses of registered pesticides, or uses of unregistered pesticides, to USDA-APHIS personnel, State Departments of Agriculture personnel, or possibly farmers or individuals to use a specific pesticide for a limited time by designated personnel. USDA-APHIS has exemptions in place for the use of citric acid and sodium hypochlorite (bleach), against the FMD virus in the event that registered pesticides are not available during an outbreak.

8.1 Safety

Follow all safety precautions and use directions listed on the product label during the handling and mixing of disinfectant solutions. Wear eye and respiratory protection when mixing or spraying disinfectants. Wear gloves to avoid skin contact with caustic materials. Immediately wash off any disinfectant that contacts bare skin.

8.2 Contact Time

Before disinfecting, all surfaces must be cleaned (see section 7). Disinfectants will not be effective unless the surface they are applied to remains visibly wet for the required period of time. Read label directions for this contact time. Disinfectants mixed with water are susceptible to evaporation in hot or windy conditions and in direct sunlight and thus will not be completely effective unless reapplied. Curved surfaces that cause disinfectants to run off (like milk trucks/tankers) may require reapplication to keep the surface wet for the required contact time.. Since disinfectants, climates, and environmental regulations vary, work with the animal health authority for specific recommendations. Dairy equipment can be damaged by inappropriate uses of disinfectants, so proper use is critical to destroying the virus while maintaining the equipment.

8.3 Proprietary Products

EPA registered products with a label claim to inactivate FMD virus are listed in Table 1. Any of these products may be selected and used according to their labels. For more detailed information about available products, refer to the official label currently filed by the EPA by searching (product name or registration number) on the U.S. EPA Pesticide Product Label Search website at <http://iaspub.epa.gov/apex/pesticides/f?p=PPLS:1:1719419566286576>.

Table 1. Pesticide Products Approved by EPA For Use Against FMDv

EPA Reg. No.	Product Name	Company	Active ingredient(s)	Use sites
1677-129	Oxonia Active	Ecolab, Inc.	Hydrogen peroxide Peroxyacetic acid	Food and mouth disease virus in/on livestock barns, livestock premises, animal quarters, animal cages, milking equipment, dairy equipment, and agricultural premises
6836-86	Lonza DC 101	Lonza, Inc.	Alkyl dimethyl benzyl ammonium chloride Didecyl dimethyl ammonium chloride	Foot and mouth disease virus in/on livestock premises, livestock feeding and watering equipment, and livestock equipment

EPA Reg. No.	Product Name	Company	Active ingredient(s)	Use sites
			Octyl decyl dimethyl ammonium chloride Dioctyl dimethyl ammonium chloride	
10324-67	Maquat MQ615-AS	Mason Chemical Company	Octyl Decyl Dimethyl Ammonium Chloride Didecyl Dimethyl Ammonium Chloride Dioctyl Dimethyl Ammonium Chloride Alkyl	Foot and mouth disease virus on non-porous (inanimate and environmental) surfaces in animal feed equipment, livestock pens, livestock stables, livestock equipment, dairies, milk storage handling systems, bulk milk tanks, milk pipelines, milk pails inflations and tubing, dairy product dispensing equipment, animal quarantine areas, waterers, stalls, floors, vehicles and human footwear
70060-19	Aseptrol S10-TAB	BASF Catalysts, LLC	Sodium chlorite Sodium dichloroisocyanurate dihydrate	Foot and mouth disease virus in/on animal cages, animal stables, animal feeding/watering equipment, animal equipment, and animal transportation vehicle
70060-30	Aseptrol FC-TAB	BASF Catalysts, LLC	Sodium chlorite Sodium dichloroisocyanurate dihydrate	Foot and mouth disease virus in/on livestock premises, livestock feeding equipment, livestock watering equipment, livestock equipment, livestock transportation equipment, hog barns/houses/parlors/pens, animal quarters, animal cages, animal feeding and watering equipment, animal equipment, animal transportation vehicles, and shoe baths.
71654-6	Virkon S	E.I. du Pont de Nemours & Company	Sodium chloride Potassium peroxymonosulfate	Foot and mouth disease virus in/on animal feed equipment, livestock barns, livestock pens, livestock stalls, livestock stables, livestock equipment, cattle feedlot, hog farrowing pen premises, hog barns/houses/parlors/pens, animal quarters, animal feeding and watering equipment, animal equipment, agricultural premises, agricultural equipment, animal transportation vehicles, and human footwear

Source of Table 1: Pesticides to use against selected foreign animal diseases, January 2015 at http://www.aphis.usda.gov/animal_health/emergency_management/downloads/fad_epa_disinfectants.pdf

8.4 Exemptions for Use of Registered Products

USDA-APHIS has an exemption in place for the use of citric acid and sodium hypochlorite (bleach) against FMD virus in the event the proprietary products are not available. As with all

disinfectants, all label use directions and safety precautions must be followed. For more information, see: http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/emergencyresponse?1dmy&urile=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_animal_health%2Fsa_emergency_management%2Fct_disinfectants.

8.4.1 Citric acid (99% food grade anhydrous granular or powder)

A 3% solution is made by adding 4 ounces of citric acid powder to 1 gallon of water (or 30 grams to 1 liter of water). For larger batches, start with 13 pounds of citric acid powder and add water for a total of 50 gallons. Mix thoroughly.

- Recommended wet contact time
 - 30 minutes for porous surfaces (wood, asphalt, and pervious concrete)
 - 15 minutes for non-porous surfaces (metal, plastic, glass and any painted or sealed material)
- The solution must be mixed fresh daily and is corrosive.
- The solution must not be mixed or used with bleach, chlorinated products, or mildew stain removers.
- Citric acid solution can be used on food and nonfood contact surfaces.
 - USDA-APHIS has an exemption for use of citric acid against FMD virus by USDA APHIS personnel, any State Departments of Agriculture personnel, farmers, and any other individuals who need to use this disinfectant on surfaces potentially exposed to FMD (EPA Quarantine Exemption issued to USDA, February 2016).
- The citric acid section 18 exemption label can be found at: https://www.aphis.usda.gov/animal_health/emergency_management/downloads/CitricAcidexemptionlabel.pdf

8.4.2 Sodium hypochlorite 5.25%, 8.25% or 12% (concentrated household bleach)

To make a 3% sodium hypochlorite solution (30,000 ppm available chlorine), add:

- 1 part 5.25% sodium hypochlorite product to 0.75 parts water
- 1 part 6.25% sodium hypochlorite product to 1.75 parts water
- 1 part 12.0% sodium hypochlorite product to 3 parts water
 - USDA-APHIS has an exemption for use of sodium hypochlorite against FMD virus by USDA APHIS personnel, any State Departments of Agriculture personnel, farmers, and any other individuals who need to use this disinfectant on surfaces potentially exposed to FMD (EPA Quarantine Exemption issued to USDA, September 2015).

Recommended wet contact time:

- 30 minutes for porous surfaces (wood, asphalt, and pervious concrete), reapplying solution when necessary. Rewet with a minimum of two applications with at least 15 minutes between the first and last application.
- 15 minutes for non-porous surfaces (metal, plastic, glass and any painted or sealed material), reapplying solution when necessary.
- The solution must be mixed fresh and is corrosive.
- No treatments are permitted on food or feed items or where food or feed are present.
- Personal protective equipment is recommended to protect from dermal and inhalation exposure.
- The sodium hypochlorite section 18 exemption label can be found at: https://www.aphis.usda.gov/animal_health/emergency_management/downloads/15DA01signed-authorization.pdf