

**VIROSAN
LINE**

**POWERFUL
BROAD-
SPECTRUM
DISINFECTANTS**

**MODERN
FARM
BIOSECURITY
SOLUTIONS**

VIROSANs: UNIVERSAL DISINFECTANTS

HIGH QUALITY • SAFETY • LOW DOSAGE



VIROSAN



For daily biosafety. A universal basic product for regular preventive disinfection of premises, equipment, and transport, as well as for refilling disinfection barriers.

QAC	GA	FA	Total active ingredients
25%	11%	-	36%



VIROSAN MAX



For maximum protection at a high risk of infection. Enhanced capabilities for forced and final disinfection, especially with organic contamination and the risk of highly dangerous infections

QAC	GA	FA	Total active ingredients
12.5%	25%	-	37.5%



VIROSAN F / VIROSAN F2



For complex disinfection. Suitable for processing livestock and poultry houses, incubators, equipment, eggs, and containers by spraying or fogging methods

QAC	GA	FA	Total active ingredients
5% (F) 5% (F2)	10% (F) 5% (F2)	14.8% (F) 18.5% (F2)	29.8% (F) 28.5% (F2)

QAC — quaternary ammonium compounds (benzalkonium chloride);
GA — glutaraldehyde; FA — formaldehyde

PROVEN FORMULAS. PROVEN RESULTS

QAC AND ALDEHYDE-BASED TECHNOLOGY

The **VIROSAN** disinfectant formulations combine QACs and aldehyde-based active ingredients to provide broad-spectrum disinfection. This approach is especially relevant in intensive livestock and poultry production, where mixed contamination, organic load and constant infection pressure require reliable disinfection between production cycles.

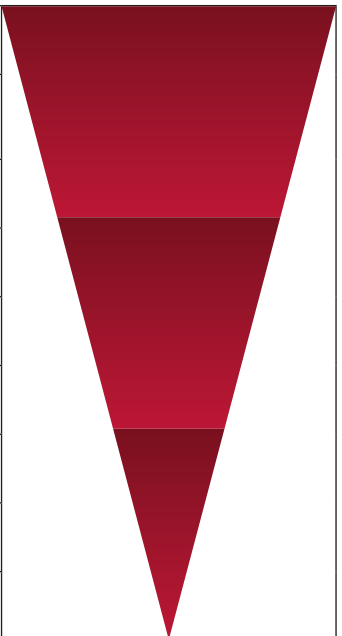
VIROSAN disinfectants retain their effectiveness in the presence of residual organic matter, under intense light, in hard water, and over a wide temperature range. When used according to the recommended protocol, their formulations are non-corrosive.

QAC	Benzalkonium chloride (alkyl dimethyl benzyl ammonium chloride)	Surface-active QAC component that improves surface wetting, promotes rapid disruption of bacterial membranes and viral envelopes, and increases the overall effectiveness of combined disinfectant formulations.	Gram-positive and Gram-negative bacteria, fungi and enveloped viruses
Aldehydes	Glutaraldehyde	Effective against a wide range of bacteria and all virus families, even at low concentrations. It works by denaturing proteins and destroying important cellular and viral structures. Remains active in challenging farm environments when used as recommended	Gram-positive and Gram-negative bacteria, mycobacteria, bacterial spores, fungi, enveloped and non-enveloped viruses, including pathogens relevant to poultry and livestock biosecurity
	Formalin	Aqueous solution of formaldehyde. Active against a wide range of micro-organisms. Works by coagulating proteins and damaging nucleic acids, thereby inactivating bacteria and viruses	Gram-positive and Gram-negative bacteria, fungi, enveloped and non-enveloped viruses; and bacterial spores, when used under proper conditions
	Gaseous formaldehyde	Can be used to fumigate equipment that needs to be kept dry, including hatching eggs, egg crates, and other hatchery equipment. Penetrates hard-to-reach areas and inactivates microorganisms by damaging proteins and nucleic acids	Suitable for controlling bacterial, viral, and fungal contamination. Less effective on organic contaminants. The room must be completely sealed

PROVEN FORMULAS. PROVEN RESULTS

DISINFECTION CHALLENGE

Microorganisms differ in their resistance to disinfectants. Enveloped viruses and vegetative bacteria are generally easier to inactivate, whereas non-enveloped viruses, mycobacteria, and bacterial spores require stronger, more reliable disinfectant formulations.

Enveloped viruses (HVT, IBV, NDV, AIV, POX, ASFV, PRRSV, PEDV)	
Vegetative bacteria (<i>E. coli</i> , <i>Salmonella</i> spp., <i>Staphylococcus</i> spp., <i>Streptococcus</i> spp., <i>Enterococcus</i> spp., <i>Pasteurella</i> spp.)	
Yeasts (<i>Candida</i> spp.)	
Moulds (<i>Aspergillus</i> spp., <i>Penicillium</i> spp.)	
Large non-enveloped viruses (REO, FAdV, IBDV)	
Mycobacteria (<i>Mycobacterium</i> spp., tuberculosis-causing mycobacteria)	
Small non-enveloped viruses (FMDV, PARVO, PCV2, CAV, AE)	
Bacterial spores (<i>Clostridium</i> spp., <i>Bacillus</i> spp.)	
Cysts / Oocysts (<i>Eimeria</i> spp., <i>Cryptosporidium</i> spp.)	

OPERATIONAL BENEFITS

Disinfectant	Surfactant properties	Corrosive activity	Organic load	Effect of high temperature	Prolonged action
Alcohols	+	-	-	-	-
Chlorine-based	-	+++	+/-	+/-	-
Oxidizing agents	-	++	+/-	+/-	-
Iodophors	+	+	+/-	+/-	-
Phenolics	+	+/-	++	+	+
Alkalis	-	+++	++	+	-
QACs	+++	-	+/-	++	++
Aldehydes	-	+/-	++	++	+
QACs + Aldehydes	+++	-	+++	+++	+++

- very low/absent; + low; ++ moderate; +++ high.

EFFICACY STUDIES AGAINST KEY PATHOGENS

POULTRY VIRUCIDAL EFFICACY DATA

EFFICACY STUDY 1: AIV & IBDV

Commercial QAC + glutaraldehyde combination was tested against LPAI and wIBDV under poultry organic challenge conditions. Working concentrations: 0.5–2%. Contact time: 10 min (Figueroa A, et al., 2017)

Virus / disease	Virus type	Poultry organic material	Result
LPAI / avian influenza virus	Enveloped virus	Chicken feces	Virus not re-isolated
		Feathers/dust + feces	Virus not re-isolated
		Wood shavings + feces	Virus not re-isolated
wIBDV / Gumboro disease virus	Non-enveloped virus	Chicken feces	Partial effect
		Feathers/dust + feces	Virus not detected
		Wood shavings + feces	Partial effect

EFFICACY STUDY 2: NDV, REO & FADV

A disinfectant formula containing 12% glutaraldehyde and 10% QAC was tested against NDV, chicken reovirus and fowl adenovirus (Sobhy NM, et al., 2024)

Virus / disease	Virus type	Dilution	Contact time (min)	Virus reduction (%)
NDV / Newcastle disease virus	Enveloped virus	1:100	5	99.40
		1:100	15	99.97
		1:100	30	99.99
		1:100	60	99.99
		1:200	5	90.07
		1:200	10	99.39
		1:200	30	99.78
		1:200	60	99.98
Chicken reovirus / REO	Non-enveloped virus	1:100	5	≥99.99
		1:100	15	≥99.99
		1:200	5	53.58
		1:200	15	≥99.99
FAdV / IBH-associated virus	Non-enveloped virus	1:100	5	≥99.99
		1:100	15	≥99.99
		1:200	5	95.32
		1:200	15	≥99.99

EFFICACY STUDIES AGAINST KEY PATHOGENS

FOOT-AND-MOUTH DISEASE VIRUS

FMDV: A RESISTANT NON-ENVELOPED VIRUS

Foot-and-mouth disease virus is a small non-enveloped RNA virus from the Picornaviridae family. Due to its non-lipid structure, FMDV is more resistant to many chemical disinfectants than enveloped viruses, making it a challenging target for on-farm biosecurity programs.

Effective control of FMDV requires a structured disinfection approach, that includes proper cleaning, removal of organic matter, correct working concentration and sufficient contact time. Aldehyde-based active substances, including glutaraldehyde and formaldehyde, are recommended by the European Commission for the Control of Foot-and-Mouth Disease (EuFMD) for use in foot-and-mouth disease disinfection programs.

DISINFECTANT ACTIVITY AGAINST FMDV

Aldehydes	Caustic agents	Chlorine-based	Iodine-based	Phenolics	QACs
++	++	+	+/-	-	-

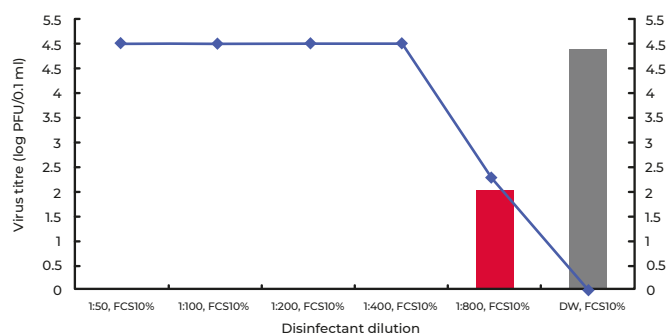
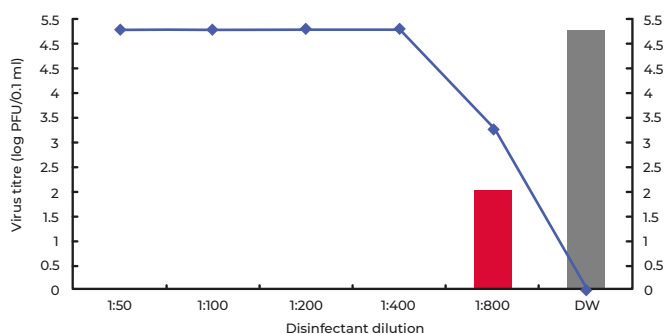
GLUTARALDEHYDE EFFICACY AGAINST FMDV

A disinfectant containing glutaraldehyde as the active ingredient — 25 g/100 ml — demonstrated virucidal efficacy against FMDV at working dilutions from 1:400 to 1:50, which corresponds to 0.25–2% working solutions.

The study showed a high level of FMDV inactivation across the tested concentrations. Glutaraldehyde also demonstrated strong virucidal activity in the presence of 10% organic contamination, confirming its relevance for disinfection in challenging farm conditions (Shirai J., 2012).

Figure explanation:

Left graph: blue lines indicate titres of inactivated virus; columns indicate residual virus titres. Right graph: efficiency in the presence of 10% organic contamination.



DW – distilled water; FCS – fetal calf serum

AFRICAN SWINE FEVER VIRUS

Independent studies conducted by the Marzieiev Institute for Public Health and the National Scientific Center “Institute of Experimental and Clinical Veterinary Medicine” have confirmed the effectiveness of the VIROSAN disinfectant line. Tests under protein and organic load conditions have demonstrated bactericidal, fungicidal, virucidal, and tuberculocidal activity against a wide range of pathogens, including Newcastle disease virus and mycobacteria responsible for tuberculosis.

The study confirmed the complete inactivation of the ASF virus on contaminated concrete surfaces, particularly under conditions of organic contamination, a key challenge in farm disinfection.

The tests were carried out under conditions as close as possible to real field conditions. To evaluate the disinfectant activity of **VIROSAN MAX**, test surfaces were contaminated with virulent ASF virus and then protected with organic material to simulate contamination on a livestock farm.

The disinfectant was tested at working concentrations ranging from 0.5% to 2.0%, and exposure times ranging from 15 to 180 minutes, depending on test conditions. The efficacy was confirmed by a bioassay on susceptible animals, which revealed no signs of infection after treatment of contaminated surfaces with **VIROSAN MAX**.

DETERMINATION OF THE DISINFECTANT EFFECT OF VIROSAN MAX IN A BIOASSAY DURING DISINFECTION OF TEST OBJECTS MADE OF CONCRETE INFECTED WITH ASF VIRUS

Nº	Drug concentration, %	The presence of protein protection	Consumption rate, L/m²	Exposition, minutes	"Test-surface Concrete Died/total"
1	2,0	-	0,3	30	0/3
2	2,0	-	0,3	15	0/3
3	2,0	+	0,5	30	0/3
4	1,0	+	0,5	180	0/3
5	0,5	+	0,5	180	0/3
6	0,5	+	0,5	60	0/3
7	control				1/1

References:

1. Figueroa, A., et al. (2017). Combination of quaternary ammonia and glutaraldehyde as a disinfectant against enveloped and non-enveloped viruses. Journal of Applied Poultry Research, 26(4), 491–497.

2. Havrylenko, A. V., Kovalenko, V. L., Nedosiekov, V. V., & Sytiuk, M. P. (2016). Methodological recommendations for the use of Virostan Max disinfectant at veterinary facilities [in Ukrainian]. Vasyilkiv, Ukraine.

3. Shirai, J. (2012). Disinfection against outbreaks of foot-and-mouth disease. Journal of Disaster Research, 7(3), 264–273.

4. Sobhy, N. M., et al. (2024). In vitro virucidal activity of a commercial disinfectant against viruses of domestic animals and poultry. Frontiers in Veterinary Science, 10, 1276031.

APPLICATION & USE GUIDANCE

APPLICATION BY SPRAYING / FOAMING

Target area	Disinfectant	Working solution concentration	Solution flow rate	Exposure time
Spraying, wiping				
Poultry houses, pig houses, and cattle facilities — preventive disinfection	VIROSAN	0.25%	1 L / 4–12 m²	60 min
	VIROSAN MAX	0.25–0,5%	1 L / 4 m²	
	VIROSAN F	0.25–0.5%		
	VIROSAN F2	0.3–0.5%		
Poultry houses, pig houses, and cattle facilities — forced disinfection	VIROSAN	0.5%	1 L /4 m²	60 min
	VIROSAN MAX	0.5–1.0%	1 L / 3–4 m²	60–120 min
	VIROSAN F / F2	0.5–1.0%		
Poultry houses, pig houses, and cattle facilities — against tuberculosis pathogens	VIROSAN	2.0%	1 L /1 m²	24 h
		4.0%		5 h
	VIROSAN MAX	3.0%		24 h
		4.0%		5 h
Pig farm houses — against African swine fever virus	VIROSAN MAX	0.5%	1 L /1 m²	60 min
		2.0%		15 min
Foaming				
Walls, partitions, and equipment	VIROSAN	0.25-0.5%	1 L / 4-6 m²	60 min

APPLICATION BY FOGGING

Target area	Method	Disinfectant	Application rate	Exposure time
Poultry houses and pig houses	Cold or thermal fogging	VIROSAN	750 mL + 4 L of water per 1,000 m ³	3 h
		VIROSAN MAX	1 L + 4 L of water per 1,000 m ³	
		VIROSAN F / F2		

DISINFECTION BARRIERS

Target area	Disinfectant	Concentration of working solution	Application
Disinfection barriers and disinfection mats	VIROSAN	0.5%	Once a week or as the solution dries out
	VIROSAN MAX	0.25-1.0%	
	VIROSAN F / F2		

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