For over 50 years, glutaraldehyde has been the top product for dis-

fecting hog and poultry barns and for removing slime and foul-

ing from water lines. 

The chemical, invented in 1951 by Dow researchers, has shown a staying power like no other biocide. 

The reason, according to Mark Henning, Global President of Dow Microbial Control, a business unit of The Dow Chemical Company, is because of its mode of action for killing bacteria and viruses, and the fact that it readily breaks down into carbon dioxide and water. With the proper protective equipment, the chemistry has been used for decades without harm to humans or the environment. 

“It’s a sustainable chemistry. It works very well, with broad efficacy. Resistance doesn’t build up, and it biodegrades very well,” said Mr Henning, on the sidelines of the recent launch of the first ‘Genuine Glutaraldehyde’ Academy held in Bangkok last March. 

“It’s non-persistent and doesn’t bioaccumulate. For those two reasons, it has had a very, very long life.”

The patent has long since lapsed, but only the two largest chemical companies in the world continue to make it in commercial quantities – BASF and Dow because it is an “extremely difficult” manufacturing process. 

“It’s not so much patent protection, it’s process know-how,” said Mr Henning. “Many others have tried, but they have not been successful.”

Counterfeiting is a major issue for many chemical companies, but with glutaraldehyde’s high value and near universal potential for application, that’s especially true.

“People should know what they are using and how to use it, because it’s an extremely valuable chemistry.”

Glutaraldehyde has been identified by the World Health Organization (WHO) as an effective sanitizer against the Avian Influenza virus. A colorless, oily, pungent liquid, it is also used for “tracking” in oil exploration, as well as in leather tanning. Unlike formaldehyde, it has not been identified as a carcinogen.

Makers of fake glutaraldehyde often use small amounts of the chemical mixed with formaldehyde because they know that it will still pass a titration test. Others, who seek to deceive customers who test supplies using a specific gravity test, may add glyoxal.

Fake products must be used in much higher amounts to get the same effect as the genuine article and the additives may be unsafe for workers to use.

Despite the obvious risks, counterfeit glutaraldehyde is in use all over the world, even in advanced countries such as Western Europe and Australia.

“These are skillful people and very clever,” he said. “They are making a lot of money, so they are going to continue to find ways to do it.”

To address the problem, Dow Microbial Control has developed a simplified, low-cost color-change testing method that it will distribute to all markets this spring. 

“We are going to help the region get access to the product and help set up the test method,” he said, adding that Thailand will be the first in Southeast Asia, followed by other countries later in the year. 

Since chemical agents first began being widely used in agriculture about 60 years ago, a broad array of anti-microbial products have been developed ranging from hydrogen peroxide, ammonia-based chemicals, strong oxidizers, and bleach and chlorine. All of them have varying degrees of efficacy based on the requirements of the user.

“But you have to look at what pathogens you need to kill,” he said. “In animal health, husbandry and biosecurity, glutaraldehyde is the best because it has the broadest efficacy, it biodegrades and can be used very safely by workers all the way through the food chain.”

Although Dow Microbial Control is not working on new molecules to replace it, the chemical giant is working on new technologies such as mixtures and additive combinations that can be used to supplement glutaraldehyde.

The cost barrier is one reason, because new chemistry development is very expensive. The global market for biocides is worth about USD$10 billion a year, but it could cost USD$150 million just to discover a new molecule.

“It’s very risky and very difficult to be successful. In many ways it’s like the pharmaceutical industry but without the payoff,” he said.