

Expels Solution for The Control of Odours on Hard Surfaces

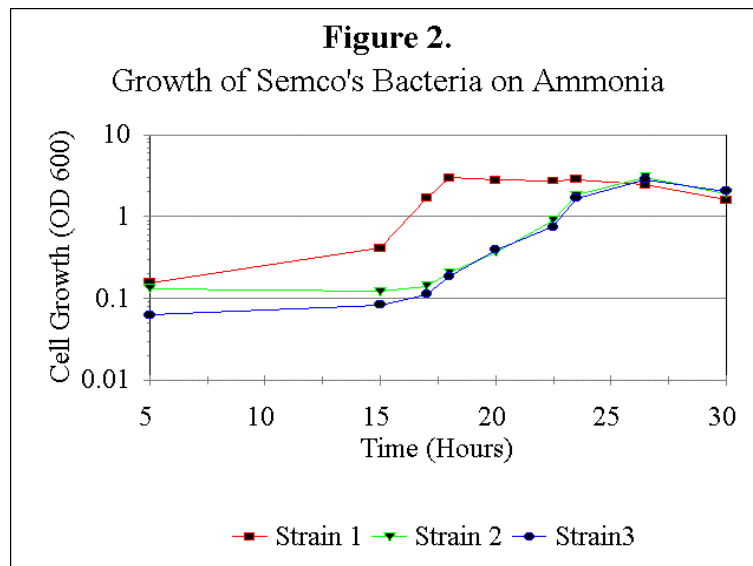
Urine is often the source of bad odours on tile, grout, toilets, and other hard surfaces. Urea is the primary constituent of urine. Many bacteria that are naturally present on hard surfaces produce an enzyme called urease. Urease converts urea into carbon dioxide (CO₂) and ammonia (NH₃), Figure 1. This process results in the generation of bad odors from the release of ammonia into the atmosphere. To reduce the odors, one must reduce, or eliminate, the ammonia.

Figure 1. The Breakdown of Urea by Urease



With this background information, the scientists at Semco Laboratories and Aquatera Laboratories set out to develop a biologically based product to degrade urea and utilize the liberated ammonia. The first step in the development of the product was to screen the bacteria in the labs culture collection for the ability to produce urease. The screen was performed using Christensen's urea agar. This medium contains urea and a yellow dye that turns red when urea is metabolized. By placing bacteria on the surface of this agar, one can choose bacteria that are superior urease producers.

Having identified bacteria that can degrade urea, a study was performed to test the ability of the most promising urease producers to utilize ammonia. For this study, replicate flasks of sterile media consisting of basal salts, glucose, and ammonia were inoculated with different strains of urease producing bacteria. The flasks were placed on an incubated shaker, and bacterial growth was monitored over a thirty hour period. An increase in growth is indicative of the ability to utilize ammonia. As demonstrated in Figure 2, some of final Ag-Scent bacteria have the ability to utilize ammonia.



These studies resulted in the selection of bacteria that are not only excellent urease producers but bacteria that also have the ability to utilize ammonia for growth. The breakdown of urine using these bacteria is shown in Figure 3. By consuming the ammonia liberated by urease, these bacteria greatly reduce odours from urine deeply imbedded in tile, grout, toilets, and other hard surfaces. When we combine the odour neutralization technology and the urease reduction characteristics of the bacterial agent we have a phenomenally effective two stage product.

Figure 3. The Breakdown of Urea by Ag-Scent's Bacteria



We are often asked what is left after your products have done their job? Are there any hazardous by-products produced? Are there any disposal problems with the residual materials? The answer to these questions is simply **NO**. What is left is simply CO₂ that is returned to the atmosphere.