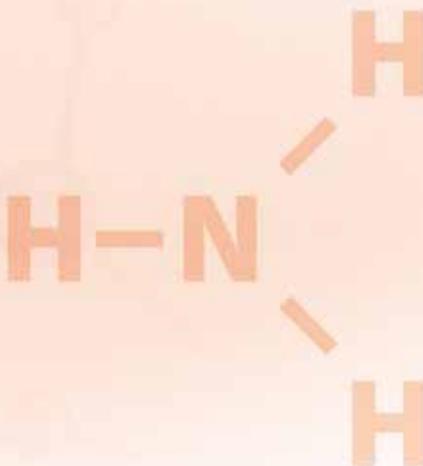


## Minimising the inhibitory effect of ammonia

*BC.ATOX* **N**con

*BC.ATOX* FLÜSSIG

*BC.ATOX* ACTIVE





## BC.ATOX product range

The acquisition of cost-effective, readily available substrates is one of the major tasks in biogas production. These include waste material from poultry farms, e.g. hen dung, protein-rich catch crops such as lucerne or in terms of waste fermentation, protein-rich slaughterhouse waste.

But, in biogas plants the high proportion of nitrogen in these substrates is converted to toxic ammonia. The inhibitory effect of ammonia is generally indicated by an accumulation of propionic acid in the propionic acid in the fermenter and an incomplete degradation of organic matter.

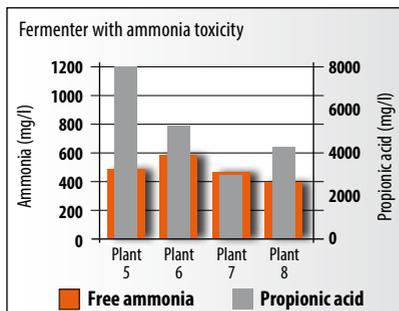
This leads to reduced plant performance and in a worst case scenario, failure of the process.

However, a stable degradation process can be achieved even when nitrogen concentrations are very high. This happens in fermenters where the microorganism population has adapted to the increased levels of ammonia (see graphs below).

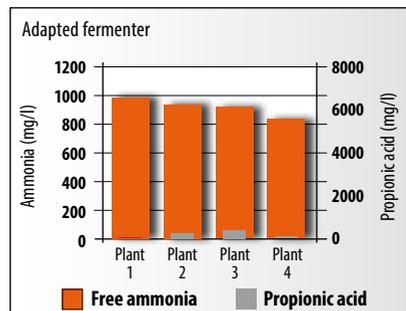
## Products in the BC.ATOX range support adaptation to increased levels of ammonia

- By selectively absorbing ammonium nitrogen
- By reducing hydrogen partial pressure
- By accelerating the degradation of propionic acid

Examples of biogas plants with modest ammonia levels showing ammonia inhibition



Examples of biogas plants with high levels of ammonia in which selective adaptation has prevented a build-up of propionic acid



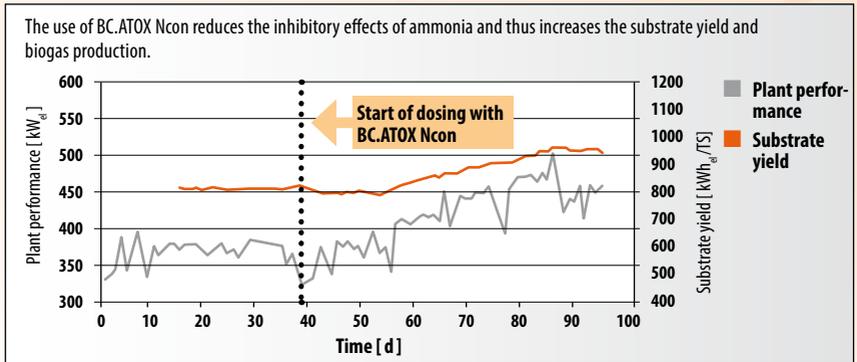
# Stabilised process biology – improved operating results



## BC.ATOX Ncon

BC.ATOX Ncon contains mineral substances which reduce ammonia levels in the fermenter and activate bacterial growth.

The nitrogen is bound by a process of ion exchange. The Ncon complex has a high degree of specificity for ammonium ions in particular. The proportion of highly porous zeolites additionally forms the basis for the growth of biofilms in nitrogen-rich environments.



## BC.ATOX FLÜSSIG

BC.ATOX liquid uses iron(II)chloride to effectively reduce hydrogen sulphide and remove free ammonia from the digester content.

This makes BC.ATOX liquid the ideal combination product for plants with elevated levels of nitrogen in the fermenter and a high desulphurisation demand.



**BC.ATOX** *ACTIVE*

**NEW**

BC.ATOX Active contains a special combination of secondary plant metabolites with mineral active ingredients.

The product acts even before an inhibitory effect arises by selectively supporting the growth of microorganisms that are resistant to ammonia and reducing the formation of toxic ammonia. At the same time it boosts the conversion of free hydrogen, thereby counteracting the increased formation of propionic acid.

## The result

- Stability and good degradation efficiency in plants with a high proportion of nitrogen-rich substrates
- Microorganisms resistant to ammonia are supported and harmful microorganisms (parasites) suppressed
- Microfauna adapt more rapidly to higher concentrations of nitrogen
- More intensive use of cost-effective, protein-rich substrates
- More full-load hours through the avoidance of process interruptions

Dosing quantities of BC.ATOX products are calculated according to the nitrogen level in the fermenter based on an in-depth consultation with Schaumann BioEnergy specialist advisers.

