



Tales from the Lab

The Philosophy of "Gentle Chemistry"

A review of why we established Tri Nature and what sets us apart from the mainstream. PART TWO

By Brian McLean, Tri Nature Director and research chemist (from an article for the Natural Health & Vegetarian Society, co-written by Janet Saxton).

Note: The article from which the following excerpt is taken is based around the most frequently asked questions and responds to the perennial question "what makes Tri Nature different from the rest?" It features in part in the February issue of The Natural Health and Vegetarian Society Magazine. It follows directly on from Part 1, featured in the February "Nature of Things".

I believe that the 'Tri Nature' difference is a result of the difference between Tri Nature's *philosophy* and that of the companies which develop products for sale through supermarkets.

If we analyse the products available to us on the supermarket shelves, we find that, despite the advertising hype, supermarket cleaning products are all very similar to each other. They are all pared down to the lowest common denominator in order to achieve the lowest possible price.

We normally don't go supermarket shopping for something of special quality. If we are after a special item, we go to a specialist shop. In the area of household chemicals and personal care, the lowest common denominator approach means manufacturing a barely workable, often irritating product for the lowest possible cost... in stark contrast to Tri Nature's 'best and gentlest' approach.

Dishwashing Detergents...

Let me take just one simple example of the most used household liquid product – dishwashing detergent:

All supermarket dishwashing liquids are based on *sodium dodecylbenzene sulphonate*. This detergent agent, manufactured from an aromatic petroleum solvent (*dodecyl benzene*), offers good foam and grease-cutting properties, but is very harsh on the skin and leads regularly to irritation and redness of users' hands. These formula types have changed very little since the advent of biodegradability legislation in the 1970s, and while they are not inherently *dangerous*, little consideration if any is given to making the product gentler or to creating the most efficient

product possible. Cost is the overriding factor.

Sodium dodecylbenzene sulphonate is easily thickened with common salt. Products in the cheaper price brackets, with very low active contents, are made to look more concentrated by this method.

Tri Nature uses a very different approach:

Chamomile, our liquid dishwashing product, is highly concentrated and built from very gentle, cosmetic grade materials.

All our surfactants are vegetable based, very readily biodegradable and more usually found in high quality shampoo type products.

Only 4 ml of Chamomile is needed to provide excellent results, and reusable pumps are available to eliminate wastage.

It is a very versatile product that can be used for many light-duty jobs around the home, and, with up to 250 washes in each one-litre bottle, is extremely economical.

We are continually working on improvements, and our work with *alkyl glucoside* technology is currently being used to create an even gentler and more efficient Chamomile product.

...And other non-toxic products

Chamomile is just one of the products in the Tri Nature range demonstrating that quality, gentleness and economy can exist in the one package.

It is important to understand that the best cost-efficiency level for any product type is never found in the cheapest possible product.

Similar comparisons can be drawn with all of the *relatively safe* supermarket product types.

The real dangers...

At Tri Nature we have had many people speak to us of the headaches and

dizziness they experience when using some leading brand products for general cleaning around the home and especially in confined spaces like shower and toilet areas.

Let me indicate a few freely available household chemical types that pose a real threat to health and safety in the home, and for which Tri Nature offers much gentler and safer alternatives.

Chlorine bleaches

The active ingredient in liquid bleach is *sodium hypochlorite*, which is freely available in supermarkets in concentrations from three to six percent. These products are stabilised with caustic soda and can have pH levels over 12.5 (highly alkaline).

A number of these product types are thickened and used on the vertical surfaces of showers and toilet bowls.

Sodium hypochlorite is a potent oxidising agent, which accounts for its bleaching effects, destruction of body fat and soap scum in showers or baths and its corrosiveness to human tissue.

Concentrated solutions can produce severe tissue injury. Skin or eye exposure produces local burning and irritation and can cause serious corneal damage.

Inhaling sodium hypochlorite fumes may lead to sore throat, cough, wheezing, shortness of breath and pulmonary oedema (fluid in the lungs).

Ingestion of household bleach can cause oral, oesophageal and gastric burns, as well as nausea, vomiting, diarrhoea and abdominal pain.

Acidic Products

Toilet bowl cleaners often contain various concentrations of corrosive agents, including *sulphuric acid*, *hydrochloric acid*, *oxalic acid* or *sodium bisulphate*.

Symptoms following exposure to any of them will depend on the route,



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concentration and duration of contact.

Acids directly damage the surface layers of tissues. Effects on the skin can range from reddening and swelling to blister formation and overt skin destruction. Eye exposure may result in burning, pain, redness and corneal damage.

Inhaling acid fumes can cause sore throat, coughing, wheezing and shortness of breath. Severe exposure can cause pulmonary oedema (although this is not likely with most household cleaning products). Ingestion can lead to severe oral, oesophageal and gastric burns, nausea, vomiting and abdominal pain.

Alkaline cleaners and ammoniated products

One nationally advertised product for shower cleaning is an alkaline liquid with strong, penetrating and choking volatility when sprayed. Products of this type contain *volatile organic compounds* that act as solvents for soap scum and greasy soils.

They are inhaled in mist form when sprayed and can easily irritate the nose, mouth, throat and chest. More severe exposure can cause hoarseness, coughing and difficulty in breathing.

Ammonium hydroxide is another caustic ingredient found at levels between four and six percent in common ammoniated cleaners. It is highly volatile and gives off choking fumes with similar detrimental effects to other alkalies

Skin contact with alkaline solutions can produce a soapy feel because of their ability to solubilise skin fats and proteins.

They can produce severe pain, blister formation and tissue destruction. Eye exposure may bring burning, pain, redness and severe corneal injury.

Ingestion can lead to severe oral, oesophageal and/or gastric burns, nausea, vomiting and abdominal pain.

While casual exposure to any of these products can be dangerous, other commonly used cleaning products that contain *low* concentrations of bleach, corrosives or caustic substances are

mostly not likely to be serious health hazards, if used according to instructions.

Fatal mistakes

However, exposure to the toxic effects of a *combination* of them can be deadly.

In an attempt to make cleaning products work better and faster, people have been known to mix multiple cleaning agents. This is an extremely dangerous activity, as indiscriminate mixing of products can lead to the release of toxic chlorine or chloramine gases.

Mixing bleach with acidic, ammonium, or nitrogen-containing products can be fatal and everyone should be discouraged from mixing **any** cleaning products.

Some specific alternatives...

Tri Nature's approach to cleaning in shower and toilet areas is much gentler on both the person cleaning and the environment. One of two products is generally recommended:

Optimate is a mildly-alkaline cleaner built around several highly efficient vegetable-based detergent agents. It contains a dual solvent system derived from orange oil and sugar. This three-faceted attack (of mild alkalinity, efficient detergency and natural-based solvency) deals with the oily and proteinaceous soils of the shower and bath areas easily - and safely.

Excel is a mildly acidic cleaner that is highly effective and safe to use. Excel is based on citric acid that is potentiated (or activated) with a small amount of acetic acid. Both are organic acids derived from sugar and both are readily biodegradable.

The formula also includes efficient, vegetable-based surfactants and a sugar-based solvent. The organic nature of Excel has a strong affinity and solubilising action on soap scum and body fats. The product is also efficient in the removal and prevention of water staining in toilet bowls and basins.

Automatic dishwashing powders present another potential household hazard. Their high alkalinity and chlorine content has proven to be a

dangerous combination, as many reported domestic accidents have attested.

Tri Nature's alternative, **Citrus Dishwashing Concentrate**, is the greatest safety breakthrough ever within our range of household products.

With the lowest pH of any powdered dishwashing product, it contains none of the caustic, alkaline or chlorinated compounds that have caused so much harm to children around the world.

A child who breaks through all the household safety precautions to get to it will survive the experience without sustaining permanent, irrevocable harm to the digestive tract or internal organs, which would surely be the result of ingesting other powdered dishwashing products on the market.

The health and safety advantages of our other products over their supermarket counterparts are not so extreme. Nevertheless, each and every product in the Tri Nature range is very efficient and exceptionally gentle to the user and the environment.

This is Tri Nature's philosophy – the philosophy of gentle chemistry.

Note from co-author Janet Saxton, of Victoria: Brian McLean has written several articles for the New Vegetarian and Natural Health magazine. As an industrial and manufacturing chemist, having majored in organic chemistry, the publishers feel that he has a vast background and experience upon which to draw when answering general questions on potential safety issues surrounding the cleaning products present in today's marketplace.

Brian's previous articles are presented in NVNH on page 42 of the following issues – Winter 2003, Spring 2003 and Summer 2003/4. Each of these issues is still in stock in the NHS Bookshop.

Acknowledgement from Brian McLean and Tracey Freinberger: Thank you, Janet Saxton, for your tireless efforts to bring truth and enlightenment on issues such as these to the readers of NVNH – and your assistance with both subject matter and content. ...