



# How to beat milk adulteration

*by Ina Jordaan, managing director: Dairy Standard Agency*

*“When consumers buy milk, they have the right to assume that it will be pure and unadulterated. The South African dairy industry should provide adequate quality control systems”*

No substance may be added to milk to extend its shelf life or preserve the product. Unnecessary adulteration can be prevented. This will improve dairy quality, public health and peace of mind.

The Dairy Standard Agency (DSA) was appointed to fulfil this need. As a quality monitoring body, the DSA strives to limit adulteration and other forms of fraud. These practices undermine the development of the industry and reduce consumer confidence.

### What is milk adulteration?

Adulteration means all non-accidental, preventable changes to dairy or dairy processes that reduce quality or create avoidable risks. It also refers to the counterfeiting of dairy. The old way of thinking was that there is a distinction between adulteration and the contamination of food.

However, contamination refers to contaminated or tainted food/dairy, undesirable residues and inappropriate particles or micro-organisms finding their way into food. In the previous century, the word “adulteration” covered both these meanings.

**Milk adulteration refers to marketing a product as “milk”, while the product does not comply with the legal definition of milk. Milk adulteration includes practices where the following are added or mixed with milk:**

- Water
- Whey
- Whey and water
- Milk powder and water
- Butter (added to skimmed milk)
- Plant fats.

### Adulteration and the law

The Agricultural Product Standards Act (Act no 119 of 1990) and regulations relating to dairy and imitation dairy products (Regulation 2581 of 20 November 1987), prescribe that milk should not be subjected to any process other than homogenisation or preservation by pasteurisation, ultra-high temperature treatment, sterilisation, chilling or freezing.

### Economic greed

Deliberate adulteration is motivated by economic greed. For obvious reasons, milk adulteration

negatively affects the consumer and the industry. The DSA takes various actions to limit adulteration. In this regard, the DSA works closely with the relevant government departments. Adulteration of milk with whey and/or water is not the only fraudulent practice that occurs. Other fraudulent practices include under-filling and selling milk with a sub-standard cream content.

Milk may be adulterated on purpose, or accidentally, during production or processing. Either a more expensive ingredient is substituted with a cheaper one, or a valued component is (partially) removed in the hope that the consumer does not notice the difference. Diluting milk with water or skimming off the cream are good examples of this long-standing practice.

Fraudulent malpractices create unfair competition. This leads to market distortions, which in turn may impact the local or even the international economy. Therefore, authentication of milk and milk products is important to both consumers and manufacturers.

### Economic adulteration

Usually, supplementation of a product with a cheap ingredient, also known as economic adulteration, does not carry a health hazard for consumers. However, this statement is not generally valid when it comes to adulterated milk and milk products. Consumers who are allergic to cows’ milk may suffer severely if they ingest ovine or caprine milk that was fraudulently mixed with bovine milk or whey. Consequently, it is necessary to set up a complicated legal framework to ensure proper consumer protection and encourage fair trade practices.

Whatever the type of fraud, authenticity tests rely either on there being a fundamental difference between the original and the adulterant, or on an intimate knowledge of the products’ composition and possible ranges of compositional variation.

### Risky business

Detecting fraud is complicated, because of the fact that quantities of certain indicators vary due to biological, climatic, agronomic and temporal factors. Moreover, processing can dramatically change the composition of minor constituents. Overly stringent specifications cannot be set for food inspection, as this will eventually increase the number of false-positive results.

Since some processors are dependent on the underlying principles to detect fraud, they have managed to tailor-blend "milk" in such a way that it complies with product specifications. In many cases no fundamental differences exist between the genuine and adulterated product.

**The most common practices found in the South African market are:**

- Extraneous water. Since milking and processing plants are wet cleaned, the most common potential adulterator in milk is extraneous water. Constant non-conformances will be an indication that water is being added
- Detergents/sterilisers are accidentally added to milk during production
- Neutralisers are used to mask acidity that has developed
- Skim-milk powder is used to elevate milk solids
- Whey and water is added
- Preservatives or inhibitory substances are added to milk to extend shelf-life
- Mixing cow's milk with goat's milk

**The quality police**

Purity criteria were empirically determined by analysing a wide array of guinea products. The process also involved creating and regularly updating a database containing information about the concentration ranges of certain indicative components of milk. To solve different cases, more than one analysis must be considered in order to detect fraud.

The challenge for food law enforcement agencies is to be one step ahead of the rest. They should constantly develop new methods to gain a better insight into food's complex chemical structure, in order to identify a set of possible marker components for authentication purposes.

Please contact the DSA on [www.dairystandard.co.za](http://www.dairystandard.co.za) or [info@dairystandard.co.za](mailto:info@dairystandard.co.za) or 012 804 0818, if you have any suspicion of adulterated milk. **M&JR**



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