



# Application Note

## Contamination Analysis In Whey Powder

### Definition

Whey remains after milk has been curdled and strained; it is a by-product of the manufacture of cheese or casein and has several commercial uses. Whey is used to produce ricotta and gjetost cheeses and is used to make many other products for human consumption and as an animal feed. The whey protein separated from this mixture is often sold as a nutritional supplement.

### The Problem

In the manufacture of *Whey Powder*, impurities can be introduced into the product through the production process and where dryers are employed, scorched particles may occur. Contamination is the determining factor of the final appearance, grade and purity of the product and ultimately the final selling price. In some cases contamination can result in the rejection of whole batches.

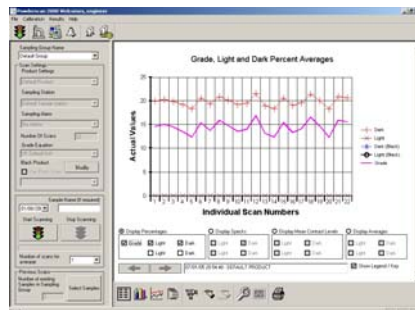
### Current Method of Detecting Contamination

The current method for analysing the number of specks relies on taking a sample from the production process or batch sampling the final product. A set quantity of Whey Powder is dissolved in solution and the contamination measured on filter paper (Filter Test). This method is subjective, destructive, non repeatable and takes time to complete.

### Powerscan Method

Powerscan uses digital image analysis to detect contamination in Whey Powder.

The Powerscan P2000 laboratory system, is able to count the number of contaminants in a given area using the digital imaging analysis. From start to finish, a result is obtained within a couple of minutes. The minimum speck size can be set so that only those specks above a preset minimum size are counted.



The Powerscan P4000 online system is the only system able to monitor in real-time to instantly detect contamination and stop production.

### Result of Tests

A variety of samples were tested from the same manufacturer. The samples had been previously graded using the conventional method. Using a Powerscan P2000 laboratory instrument, Branscan was able to detect all specks down to better than 20 microns.

Below are two images as viewed on the Powerscan P2000.

In the live image you can barely see the contamination.



In the processed image, the contamination of 100 microns or above can be clearly seen.



Branscan was able to give a contamination count corresponding to those particles shown in the processed image, some of which could not be seen by the naked eye.

Data can be displayed on the Powerscan software as both speck counts and speck percentages, however the operator can also retrieve information such as average speck size, and, if a correlation has been set up, a filter number. By using the Powerscan instruments, repeatable values can be achieved regardless of who uses the instrument. This means that the quality results given to customers are more reliable and more representative of the product.



Unity Scientific, Inc  
PO Box 1030  
Purcellville, VA 20134  
USA  
Phone: 1-540-338-8991  
Fax: 1-540-338-8992  
Email: [info@unityscientific.com](mailto:info@unityscientific.com)  
Web: [www.unityscientific.com](http://www.unityscientific.com)

