



The Cgrain Value for detecting foreign, gluten-containing grains in Gluten-Free oats

Gluten is a family of proteins found in cereals, such as wheat, rye, and barley. These proteins give bread and pasta their stretchy, chewy texture. Most people can eat gluten without difficulty but for some individuals, gluten causes serious problems such as celiac disease or allergy to cereals, two different diagnoses. Only a small number of people suffer from these problems, and for them it is important to avoid gluten.

Oats are a highly nutritious grain with many health benefits. They are popular as breakfast porridge and are also found in granola, muesli, and other foods and snacks. In addition, oats are naturally gluten-free; however, stray grains of wheat, rye or barley can be introduced during harvesting and transportation, contaminating the oats.

It is shown that gluten-free oat is tolerated and cause no problems to most people with Celiac Disease. A small number of people suffer from Celiac Disease, or gluten intolerance, and it is important that they avoid gluten. Celiac disease and Allergy to Cereals e.g. wheat allergy are two different diagnoses.

Save Time and Money
using innovative AI Technology

Celiac disease

Individuals suffering from celiac disease must avoid gluten which is a protein found in wheat, rye and barley. Celiac disease or gluten intolerance is an autoimmune disease triggered by gluten. The gluten proteins cause an inflammation of the mucosa in the small intestine leading to flattening of the mucosa and, when the illness is untreated, to malnutrition. Celiac disease is a life-long, permanent intolerance to gluten. As alternatives, products labelled “gluten-free” or “very low gluten” can be used instead. A number of clinical studies indicate that most people (adults and children) with celiac disease tolerate oat.

Allergy to cereals

Individuals suffering from wheat allergy can react with symptoms like vomiting, eczema, asthma and anaphylactic shock. Wheat and other cereals can also cause IgE-mediated allergic reactions. Such reactions are immediate or delayed after ingestion and their severity varies from mild to very severe (e.g. anaphylaxis). Gluten-free products, i.e. those with a gluten level below 20 mg/kg, are considered to be well tolerated by most people with IgE-mediated allergy to cereals.

Regulatory issues

The presence of cereals containing gluten (i.e. wheat, spelt, khorasan wheat, rye, barley, oat) and products thereof must always be declared (see also the Food Information Regulation (EC) no 1169/2011). The enzyme-linked immunoassay (ELISA) R5 method is given in the Codex standard 118-1979 as the method for determination of gluten with a limit of 5 mg gluten/kg (ppm).

Cgrain’s– patented mirror design

Cgrain’s unique mirror design allows almost 100% of the kernel surface to be assessed. This, combined with a resolution of > 100,000 pixels per grain, ensures a high degree of accuracy.

Testing for foreign seeds in Gluten-Free oats

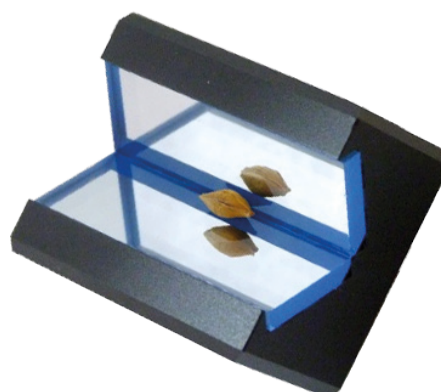
Cgrain image analysis can be used to determine foreign seeds in all grains. However, in certain products it is of extra importance, for example in the production of gluten-free oat products. Oats are naturally gluten-free, but a very low number of other kernels of wheat, barley, rye and triticale can contaminate the oat. Large samples need to be inspected to ensure that the oat is gluten-free. To do this manually is very labour intensive. Cgrain instruments, Value™ and Seedscanner, can identify foreign seeds in oats and naked / dehulled oats with very high accuracy.



Oat with hull



Dehulled oat

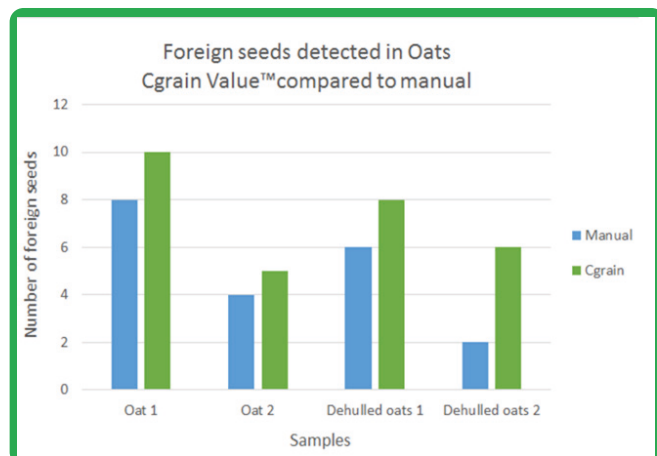


Cgrain provides two instruments for grain analysis

Cgrain offers two instruments for grain analysis, Value™ and Seedscanner. Value is the high-performance analytical tool to study defects and impurities in all grain, whereas Seedscanner is the work-horse, sorting kilogram samples into two fractions in an automated mode. Seedscanner, developed for “the determination of other seeds by number”, handles up to 36 samples over 24 hours, even if unattended.

Higher accuracy than manual analysis

It is especially difficult to detect barley contamination of oats by visual methods due to the similarities between the two grains. It has been shown that with the help of Cgrain Value™, foreign seeds can be detected more accurately than when this is done visually. Cgrain Value™ measures more than 20 different properties on every kernel and classifies them with advanced algorithms. This means every kernel is studied in a way the human eye has great difficulty doing.



Cgrain Value™ detects foreign seeds more accurately than can be done by visual assessment and it reduces the labor time by ~95%.

Easy to use

Cgrain Value™ has an easy to use interface with touch screen and a separate monitor for viewing pictures in a larger format. The procedure for viewing pictures is very easy and the method is very accurate; manual labor is reduced to a fraction of the time previously required. The results are presented on the Cgrain Value™ touch screen.



Cgrain's method used by several seed testing laboratories in Europe

The seed testing industry also tests large samples and has a crucial need to identify foreign seed. Cgrain's founder and CEO, Jaan Luup, has >30 years' experience in developing equipment for seed testing laboratories to “Determine the number of foreign seeds by number” (OSD). The Seedscanner is in use in several seed testing laboratories in Europe and is appreciated for having high detection rate and reducing the work load.

Filtered As	Count	Percentage	Weight	Man. weight	Man. count
TKW	1000		37.42		
Sieving >2.0	13293	99.74	498.69		
Sieving >2.2	12923	98.04	490.22		
Sieving >2.8	3489	33.07	165.34		
Other	98	0.29	1.43		
Weed	0	0	0		
Foreign sum	53	0.46	2.28		
Barley	13	0.14	0.69		
Wheat	18	0.19	0.94		
Triticale	2	0.01	0.07		
Rye	20	0.12	0.59		
Naked Oats	907	5.09	25.47		
Oats	12303	94.16	470.82		

Reference: Oat sample Seed Count: 13361 Weight: 500.00 g

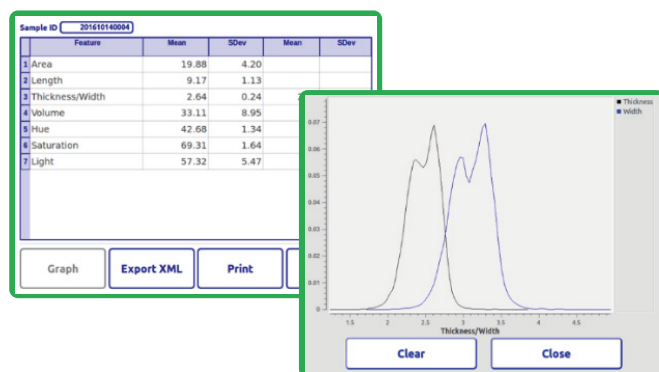
View Print Stats Export XML Finish

Focus on Gluten-Free Oats

Example of a results report from Cgrain Value™.

More data than manual analysis

Cgrain Value™ also measures seed size and color which the current visual inspection method cannot. Below are examples from some of the statistics that can be found in Cgrain Value™. More information can be found on www.cgrain.se.



Specifications Cgrain Value™

Dimensions (WxDxH): 600x400x370 mm
Weight: 38 kg
Power usage: 110-160 W
incl internal monitor
Analysis principle: RGB imaging
Interface: 3 USB-ports, RJ45 Network
Analysis speed: 8-12 kernels/second
Sample size: 25-500 grams
Sample particle size: 1- 5 mm width

Specifications Cgrain Seedscanner

Accuracy of sorting: >99%
Proportion sorted for visual inspection: 5 – 10%
Capacity: 24 samples of 1 kg or 36 samples of 0.5 kg
Self-cleaning function
Low noise level

Size (L x W x H): 1590 x 790 x 1655 mm
Weight: 150kg
Supply voltage: 100 – 240 VAC
Frequency: 44 – 60 Hz
Power consumption: 600 W
Pneumatic supply: 6 - 8 bar
Air consumption: 1 Slpm



For more information please contact us:

Webpage: www.cgrain.se Alsikegatan 4
E-mail: info@cgrain.se SE-753 23 Uppsala
Phone: +46 18 15 55 60 SWEDEN