ConsumerReports®

October 2014

Consumer Reports Test of Processed Foods for GE Corn and Soy

What we did

Consumer Reports tested a wide variety of processed foods with corn or soy ingredients on the label as a snapshot of the current US market. We only selected products with corn or soy on their ingredients list. While other GE ingredients such as canola oil, cottonseed oil, and sugar derived from GE sugar beets are likely common in foods, these ingredients are so highly processed that most of the DNA is destroyed and therefore quantitative GMO analysis of the DNA would not be possible. This is also true for many highly processed common corn and soy ingredients such as corn syrup, soybean oil, and soy lecithin. Consequently, we only tested products that contained less processed soy and corn ingredients such as corn flour and soy protein.

To assess the presence and quantity of GE ingredients in commonly available processed foods, we purchased and tested products that were conventional, claimed to be "Natural", "Organic", or "Non-GMO", which included products with a Non-GMO Project Verified label.

Product Procurement

Secret shoppers were sent out to stores selling the types of processed foods we pre-selected from a list of processed food, including many market leading brands, from the categories in table 1. Shopping occurred in the New York Metropolitan Area and the Greater Seattle area from April to June of 2014. Two distinct lots of the same product (same UPC code) were purchased and tested. If additional testing was required (see below) additional lots were purchased from May and July of 2014.

Table 1. Processed Food Categories

Breakfast Cereals
Corn Chips
Corn Tortillas
Corn Muffins/Breads/Polenta/Grits/Cornmeal
Granola & Breakfast Bars
Soy-based Infant Formula
Tofu/Tempeh
Meat Substitutes
Soy Milk & Dairy Products

Testing Methodology

For each product lot, a sample was sent to an outside independent lab with expertise in GMO testing, and the sample underwent quantitative GMO analysis of the corn/soy species DNA. Upon arrival in the lab each single sample was ground and homogenized and real-time PCR analysis was then conducted on the DNA extractions. If the corn/soy species DNA was sufficiently intact, quantitative GMO results were obtained.

Testing covered the 13 individual GM corn events commercialized for food production in North America as of the 2013 harvest.

Testing covered three individual GM soy events commercialized for food production in North America as of the 2013 harvest.

For product samples that contained corn, but no soy ingredients, the following quantitative tests were performed to capture the 13 individual GM corn events commercialized in North America for food production as of the 2013 crop:

Test	GM corn events covered by the test
35S Promoter	All 13 commercialized GM corn events except: GA21, MIR604, and MIR162
Corn GA21	GA21 (Syngenta Agrisure GT)
Corn MIR604	MIR604 (Syngenta Agrisure RW)
Corn MIR162	MIR162 (Syngenta Agrisure Viptera)

For product samples that contained soy ingredients, the following quantitative tests were performed to capture all three relevant GM soy events commercialized in North America as of the 2013 crop.

Test	GM soy events covered by the test
Soy Mon 40-3-2	Mon 40-3-2 (Roundup Ready)
Soy A2704-12	Bayer CropScience A2704-12 (LibertyLink)
Soy Mon89788	Mon89788 (Roundup Ready 2 Yield)

For products that contained both corn and soy ingredients we conducted the soy testing and also tested for corn DNA using the corn DNA reference gene Alcohol Dehydrogenase I. If corn species DNA was determined to be sufficiently intact for quantitative GMO analysis, the sample was then subjected to additional testing as follows:

Test	GM corn events covered by the test
Corn Bt11	Corn Bt11 Syngenta (Agrisure CB/LL)
Corn DAS-59122-7	Corn DAS-59122-7 (Dow Herculex RW)
Corn GA21	GA21 (Syngenta Agrisure GT)
Corn MIR162	MIR162 (Syngenta Agrisure Viptera)
Corn MIR604	MIR604 (Syngenta Agrisure RW)
Corn Mon810	Corn Mon810 (Monsanto YieldGard/MaizeGard)
Corn Mon863	Corn Mon863 (Monsanto YieldGard Rootworm RW, MaxGard)
Corn Mon87460	Corn Mon87460 (Monsanto Genuity DroughtGard)
Corn Mon88017	Corn Mon88017 (Monsanto YieldGard VT Rootworm RR2)
Corn Mon89034	Corn Mon89034 (Monsanto YieldGard VT Pro)
Corn NK603	Corn NK603 (Monsanto Roundup Ready 2 Maize)
Corn T25	Corn T25 (Bayer Liberty Link Maize)
Corn TC1507	Corn TC1507 (Dow Herculex I, Herculex CB)

In addition to the above tests all samples were also tested for a corn or soy reference gene. This reference gene test looks for a sequence of DNA common in all corn (GMO and Non-GMO) and is used as the denominator to calculate the percentage of GMO ingredient in the product.

The product was considered to be “Non-GMO” if test results show that the corn/soy DNA is not more than 0.9% GMO. The product was considered to be “GMO” if the corn/soy DNA is greater than 0.9% GMO. The 0.9% threshold is the cutoff currently used by the Non-GMO Project for food ingredients. A 0.9% threshold is also used by the European Union for “genetically modified” labeling purposes.

For products with a “Natural” label, “Organic” label, or a “Non-GMO” claim, if one or both of the initial lots of the product had a test result greater than 0.9% GMO, then both lots of that product were re-tested (DNA was re-extracted from the original homogenized samples and PCR analysis was performed again as described above). If re-testing still demonstrated that the sample(s) contained corn/soy ingredient(s) that are more than 0.9% GMO, then two additional lots of the product were purchased and tested.