

## A Part Per Million (PPM) Primer

### 1 part per million is equal to:

- One penny in \$10,000
- One minute in two years
- One dime in a one-mile-high stack of pennies
- Four drops of ink in a 55-gallon barrel of water
- 1 milligram per 1000 grams

**Or**

0.001 milligram per 1.0 gram

**Or**

0.000001 gram per 1.0 gram

(1000 mg = 1 gram; One roasted peanut weighs about 1 gram. Now imagine dividing that into 1000 equal pieces. One of those pieces would weigh 1mg)

### Upcoming FDA regulation

The FDA is charged with defining/regulating Gluten Free label claims by 2008.

The FDA has not issued its final ruling yet, but indications are that FDA will mostly likely choose: **less than 20 ppm**. It also looks like they will not include oats in the definition of gluten.

International standards use the Codex Alimentarius Commission standards, which are set at less than 200 ppm.

Canada sets a definition of less than 20 ppm for foods that make label claims of gluten free.

The Celiac Sprue Association (CSA) for the CSA Recognition Seal Program: assures to less than 3 ppm gluten.

The Gluten Free Certification Organization (a program of GIG): assures to less than 10 ppm gluten.

Less than 10 ppm = less than 0.01 milligram per 1.0 gram

Less than 20 ppm = less than 0.02 milligram per 1.0 gram

Less than 200 ppm = less than 0.20 milligram per 1.0 gram

**Examples are for comparison purposes only. Not intend to imply that these foods contain any gluten, or gluten at these levels.**

<b>Food</b>	<b>&lt; 10 ppm</b>	<b>&lt; 20ppm</b>	<b>&lt;200 ppm</b>
1 slice of gluten free bread, weighing ~ 47 g*	< 0.47 mg	< 0.94 mg	<9.4 mg
10 gluten free crackers, weighing ~ 18 g*	< 0.18 mg	< 0.36 mg	<3.6 mg
1 teaspoon of non-dairy creamer, weighing 2 g*	< 0.02 mg	< 0.04 mg	<0.4 mg

\* Check the Nutrition Facts panel for the weight, in grams, of one serving.

### **How do these levels compare with a “safe level” of gluten?**

**No “safe level” of gluten has been established yet. Sensitivity may vary.**

Study at the University of Maryland School of Medicine, published in American Journal of Clinical Nutrition (vol. 85, No 1, 160-166, Jan 2007):

- 49 biopsy proven adults with Celiac Disease on a 90 day trial
- Tested at 0 mg gluten, 10 mg gluten, or 50 mg gluten per day.
- 1 participant challenged at 10 mg gluten per day developed clinical relapse
- Conclusion: The ingestion of contaminating gluten should be kept lower than 50 mg/day in the treatment of CD.

Research done by Carol E. Semrad MD, currently with the University of Chicago and previously with Columbia Medical Center, on the amount of gluten that actually causes intestinal damage.

- Damage is dose related
- Results indicated that it only takes as little as 1/8 teaspoon of wheat flour to cause damage.

Recommended reading: *Celiac Disease A Hidden Epidemic* By Peter Green, MD.

[Note that 1/8<sup>th</sup> teaspoon of all purpose wheat flour contains about 25 – 30 mg of gluten. Wheat flour is anywhere from 8 – 14 % protein depending on whether it is cake flour, all purpose flour, or bread flour. High gluten flour is specifically milled to be high in protein and low in starch. It is about 40- 45 % protein. According to Don Kasarda, former research chemist with the USDA, about 80 % of the protein in wheat flour is gluten.]