

The hazards of raw flour

On June 13th, the FDA recalled six different lots of King Arthur brand Unbleached All-Purpose Flour sold in 5 lb. bags for potential contamination by a strain of *Escherichia coli*.

This is not the first of such recalls, and it likely won't be the last. Earlier this year, General Mills recalled its Gold Medal Unbleached Flour due to potential contamination with *Salmonella*. In 2016, their flour was part of another large recall involving contamination with *E. coli* O121 and *E. coli* O26. This contaminated flour led to 63 reported illnesses and 17 hospitalizations across 24 states, triggering an expanded recall that included other General Mills flour products such as cake, brownie and muffin mixes.

You may be asking how all of these disease-causing organisms are getting into flour. *Salmonella* is usually found in the gastrointestinal tract of birds and reptiles, while *E. coli* is often associated with the gastrointestinal tracts of people and ruminants. Although most *E. coli* are harmless, there are a handful of strains which can cause severe illness, and even death.

Animal scat in wheat fields can contaminate crops with *Salmonella* and *E. coli*, and when that affected wheat is harvested and transferred to grain silos, it can come into contact with non-contaminated wheat, thus, increasing the risk for widespread contamination. Although the entire flour production process can take months as the wheat moves from field to mill to market, both *Salmonella* and *E. coli* can survive these dry conditions for months, even years.

Unlike ready-to-eat foods such as cereals and baked goods, raw flour is especially problematic because its production doesn't entail a "kill step" (i.e. heating step), that would otherwise rid the flour of any bacteria the wheat may have come in contact with. Moreover, wheat and its products are not intended to be consumed raw, and are therefore not covered under the new produce safety regulations.

To reduce the risk of illness from *Salmonella* and *E. coli* when handling raw flour and its products, consider following the tips below from an upcoming Extension publication.

- Never eat or play with raw dough, or other raw flour products, regardless of whether it contains eggs.
- Do not allow children to play with raw dough.
- Wash your hands with soap and warm water for 20 seconds after handling raw flour.
- When baking or cooking with children, always supervise them closely to ensure they are not ingesting raw dough or flour. Make sure children wash their hands thoroughly after handling raw flour products.
- Heat flour to 160° F to kill *Salmonella* and *E. coli* before using for crafts or home-made playdough. This can be done by spreading the flour in a thin layer onto a cookie sheet and baking at 350°F for 5–10 minutes. After baking, pour the heated flour into a bowl and immediately check temperature with a food thermometer to ensure it has reached 160° F.
- Do not cross-contaminate other foods. Make sure flour is handled away from other foods, especially foods that will not be cooked. Remember that flour has a tendency to spread and hide due to its powdery nature, so always clean all work surfaces and utensils with soap and warm water.
- Be sure to follow all storage directions on products containing raw dough.
- For store-bought doughs, bake according to recipe or package directions.

Understanding that flour is an untreated, raw agricultural product is the first step to ensuring safety. Following the guidelines above can ensure safety and prevent foodborne illness from flour-based products.

If you have a food safety question you would like to see appear in this column, send your question to us at food.safety@wsu.edu.

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