

Consuming Beef, Chicken, Chicken Eggs, and Dairy Products from Animals Raised on the South River Floodplain

The land on both sides of the South River in Waynesboro, Virginia supports a number of farms and residences, some of which extend onto the area adjacent to the river that is periodically flooded (the floodplain). Although the soils in some areas of the South River floodplain have been impacted by mercury, research by the South River Science Team (SRST) has shown that eating beef and chicken products from animals raised on the floodplain would be safe as long as the consumption of these foods is limited, as described in this fact sheet.

Mercury was released to the South River as a result of past practices at the former DuPont plant in Waynesboro, where mercury was used from 1929 to 1950. From Waynesboro to Port Republic, periodic flooding has deposited river sediment containing mercury onto some South River floodplain soils. Because it is possible for families living next to the river to consume beef, chicken, and eggs and milk from animals raised on the floodplain, the Science Team evaluated mercury uptake from the soil into these foods as a possible route of human exposure.

This Fact Sheet is the third in a series that reports the results of mercury in food items from the South River floodplain. Fact Sheet Nos. 5 and 6 address mercury in garden vegetables and small game and waterfowl harvested from the South River watershed, respectively. All fact sheets are available on the Science Team website under the News and Information menu.

The Plan

The study contained two main phases, one for the beef and dairy investigations and the other for the chicken and egg investigations. In the beef and dairy study, two types of beef samples (muscle and various organs) and milk samples were collected and analyzed for mercury. Muscle and organ samples were collected from two animals raised on the South River floodplain, from two animals raised at two reference locations away from the South River floodplain, and from one market steer. Milk samples were collected from one dairy located in the South River floodplain and from two reference locations.

For the chicken study, samples of muscle, liver, gizzard, and eggs were collected from three different chicken breeds. The chickens were raised on a



Chickens were housed in mobile coops located in floodplain.

contaminated area of the floodplain in specially designed mobile chicken coops. For comparison purposes, samples also were collected from a local grocery store and from an uncontaminated farm located away from the South River floodplain.

Edible parts of these animals were analyzed for mercury, and an evaluation of potential human exposure from consuming these animals was performed using U.S. Environmental Protection Agency (USEPA) methods. Then the allowable number of meals of each type of animal product was calculated using two assumptions. A person was assumed to eat one-half pound of chicken or beef or three large eggs per meal. In addition, it was assumed that *all* of the beef and chicken products in a person's diet came from animals raised on the South River floodplain.

The Results

The allowable number of meals of each food type is shown in the table and figure on the back page. The allowable number of meals differs for adults and children because children have a lower body weight, but were assumed to eat the same amount of food as adults. Because mercury was not detected in any of the milk samples, there is no limit to the amount of milk that can be safely



consumed. Also, the results show that there would be no practical limit on the amount of beef or chicken products that could be safely eaten from an uncontaminated source, such as a grocery store. By limiting the number of meals of the beef and chicken products from animals raised on the floodplain to the values shown, eating these foods is not expected to be a health concern.



Dairy cows graze on floodplain areas.

Allowable Number of Meals Per Month from Animals Raised on the South River Floodplain*		
Food Type	Adult	Child
Poultry		
Muscle	>1000	297
Gizzard	21	4
Liver	7	1
Egg	61	11
Beef		
Muscle - Ground Beef	>1000	278
Muscle - Hindquarter	>1000	264
Muscle - Tenderloin	>1000	296
Liver	30	6
Kidney	17	3

* Based on eating one-half pound of beef or chicken or three eggs **each meal**. Portion sizes are given as uncooked weights, with no adjustment for cooking or preparation losses.

Contacts

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All fact sheets are available at:
www.southernriverstec.com/news/

The Virginia Department of Environmental Quality and others have been monitoring mercury in fish, water, sediment, and soil in and along the South River and South Fork Shenandoah River since its discovery in the 1970s. Mercury was released to the South River as a result of past practices at the former DuPont plant in Waynesboro, where mercury was used from 1929 to 1950.

In 2001, the South River Science Team was formed to serve as a focal point for technical issues concerning mercury in the South River and downstream waterways. The Science Team is a cooperative effort between the Virginia Department of Environmental Quality, Department of Health, Department of Game and Inland Fisheries and representatives from academia, citizens groups, the USEPA, and DuPont.

