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Infant Botulism and Honey[1]

Malcolm T. Sanford, Eddie Atkinson and Jamie Ellis[2]

Medical research has led doctors to suspect that one possible cause of so-called "crib death" or "sudden infant death syndrome" (SIDS) may be infant botulism (food poisoning). Infant botulism is a rare disease (fewer than 100 reported cases per year in the U.S.) which can lead to varying degrees of paralysis. Public health officials believe honey may be a potential source of infant botulism. The Infectious Disease Section and Microbial Diseases Laboratory of the California Department of Health have provided evidence that botulism spores in the immature infant intestinal tract may produce the actively growing stage of the bacterium *Clostridium botulinum*. The bacterium, in turn, manufactures a poison that can block nerve impulse transmissions. Healthy adults and children over one year of age have a more mature digestive system that prevents the *Clostridium* bacteria from surviving.

Botulism spores are found many places in nature. These include in water, soil, dust, improperly processed foods, and even air. The spores are not harmful themselves, but in the absence of oxygen they germinate and the resultant bacteria produce a powerful toxin. This is the reason canned vegetables are heated prior to packing. Bacterial spores in food are destroyed by high temperatures obtained only in the pressure canner (240-250°F). More than 6 hours is needed to kill the spores at boiling temperature (212°F). The toxin is destroyed by heating to 176°F or boiling for 10 minutes to 20 minutes.

Raw agricultural crops, however, are never heated. Many foods, even if heated or processed, once exposed to the air would be susceptible to re-infestation by botulism spores. Cumulative research on infant botulism to date, therefore, suggests that there is an unknown risk factor in feeding any raw agricultural product, including honey, to infants under one year of age.

In a survey of honey in the United States, 10% of honey samples contained botulism spores, and other data suggest an association between honey consumption and infant botulism. That said, botulism toxin has not been found in honey, nor would it be expected to be produced there due to honey's osmotic concentrations. Since honey is a potential and avoidable source of *C. botulinum* spores, the Center for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), and the National Honey Board (NHB) recommend that honey not be given to infants younger than 12 months of age.

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2. Malcolm T. Sanford, professor, Eddie Atkinson, graduate assistant and Jamie R. Ellis, assistant professor, Entomology and Nematology Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.

These research findings in no way alter many published results that honey is a highly nutritious food source or that it is bactericidal. Only bacterial spores which are highly resistant to environmental stress can exist in honey and they themselves are not harmful. Furthermore, *C. botulinum* is not a disease of honey bees, but rather the spores are a rare accidental contaminant carried into the hive on dust or in water.

The individual beekeeper can do little except be prepared to answer questions responsibly about infant botulism and honey. Beekeepers should follow the CDC Guidelines and refrain from advocating the use of honey in the feeding of infants less than one year old. This is something best left to the discretion of the parent and pediatrician. If the beekeeper is a packer or dealer in honey, (s)he may profit by looking into the adequacy of his/her product liability insurance. Finally, it is important to be able to identify the symptoms of infant botulism. These include poor feeding, respiratory distress, lethargy, constipation, weak cry, droopy eyelids (ptosis), and reduced muscle tone. If any of these symptoms are observed, (s)he should be seen by a doctor immediately.

Selected References

Aureli, P., G. Franciosa, and L. Fenicia. 2002. Infant botulism and honey in Europe: a commentary. The Pediatric Infectious Disease Journal 21: 866-868.

Domingo, R. M., J. S. Haller, and M. Gruenthal. 2008. Infant botulism: two recent cases and a literature review. Journal of Child Neurology 23: 1336-1346.

http://www.honey.com/downloads/infantbotulism.pdf

http://kidshealth.org/parent/infections/bacterial_viral/botulism.html#

Midura, T. F. 1996. Update: infant botulism. Clinical Microbiology Reviews 9: 119-125.

Schneider, K. R., M. E. Parish, R. M. Goodrich and T. Cookingham. 2004. Preventing Foodborne Illness: *Clostridium botulinum*. Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. http://edis.ifas.ufl.edu/FS104

Shapiro, R. L., C. Hatheway, and D. L. Swerdlow. 1998. Botulism in the United States: a clinical and epidemiologic review. Annals of Internal Medicine 129: 221-228.

Spika, J. S., N. Shaffer, N. Hargrett-Bean, S. Collin, K. L. MacDonald, and P. A. Blake. 1989. Risk factors for infant botulism in the United States. American Journal of Diseases of Children 143: 828-832.

Tanzi, M. G. and M. P. Gabay. 2002. Association between honey consumption and infant botulism. Pharmacotherapy 22: 1479-1483.