

AGROMEDICINE PROGRAM UPDATE

MUSC DEPARTMENT OF FAMILY MEDICINE – DIVISION OF PUBLIC HEALTH AND PUBLIC SERVICE
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Previous issues are available at www.musc.edu/oem/apunews.html

Program Notes

➤ New Lecture

On December 8, Dr. Simpson presented "Agricultural Bioterrorism" to AHEC Bioterrorism Trainers in Columbia. Dr. Simpson is available to present this lecture to medical groups, civic clubs, and other organizations.

➤ Brochures

The Agromedicine Program has a number of brochures that are available on our website (www.musc.edu/oem/brochure.html). The brochures are suitable for patient and client education and include the following titles:

- Health Effects of the Imported Fire Ant
- Noise Induced Hearing Loss
- Health Tips for the Older Farmer
- Heat Illness: Ten Questions and Answers
- Questions and Answers on Skin Cancer
- Birth Defects: Ten Questions and Answers

- What You Need to Know About Environmental Estrogens and Breast Cancer
- Allergy and Pesticides: Ten Questions and Answers
- Do You Know What to do for Acute Pesticide Poisoning?
- Eye Protection

provide reassurance to parents who are concerned that their occupational exposure to pesticides increases the risk of cancer in their children.

The study was performed by scientists with the Karolinska Institutet in Stockholm. The objective of the study was to explore the cancer risk of children born in 1958 and later to male agricultural pesticide applicators and to examine the risk until 1994. Agricultural pesticide applicators were identified through licenses issued from 1965 - 1976. The records of their children were linked to the Swedish Cancer Registry and the Cause of Death Register.

Seventy-three cases of cancer were expected among the children of pesticide applicators, but only 51 cases were observed (standardized incidence ratio (SIR) = 0.70, 95% CI = 0.52-0.92). There was a statistically significant reduced risk for leukemia (SIR = 0.43, 95% CI = 0.19-0.86).

"None of the a priori hypotheses of increased risk

HAPPY HOLIDAYS



Permission was recently given to the U.S. Navy Environmental Preventive Medicine Unit (Norfolk, Virginia) to distribute several of the brochures to personnel on 300 ships.

Cancer Risk in Children of Agricultural Pesticide Applicators

A Swedish study¹ published in last month's issue of *Occupational and Environmental Medicine* should

of tumors of the nervous system, kidney cancer, leukemia, lymphoma, soft tissue sarcoma, and testicular cancer in children of male pesticide applicators could be confirmed."

¹Rodvall Y et al. *Cancer risk in offspring of male pesticide applicators in agriculture in Sweden. Occ Environ Med* 2003; 60:798-801.

Nitrate in Drinking Water and Risk of Colon & Rectum Cancers

Nitrate is a contaminant of nitrogen fertilizers and is found in sewage (both human and animal waste from livestock facilities). Humans are exposed to nitrate from contaminated water supplies and also from consumption of vegetables.

While methemoglobinemia in infants has long been recognized as a result of overexposure to high levels of nitrate in drinking water, other health effects, such as cancers, have been suspected, but not well studied. The concern over cancer is because in the body nitrate is reduced to nitrite which then reacts with amines and amides to form N-nitroso compounds. These are known animal carcinogens. The formation of N-nitroso compounds is inhibited by vitamin C and enhanced by consumption of meats.

Scientists from the University of Iowa and the National Cancer Institute studied¹ the



association between nitrate concentrations in public drinking water and cases of colon and rectum cancers in Iowa. Cases were identified from the Iowa Cancer Registry and data on nitrate in public water supplies was obtained from the Center for Health Effects of Environmental Contaminants. Study participants either completed a self-administered questionnaire on lifestyle and water consumption factors or were interviewed by telephone.

The scientists observed negligible overall associations between colon and rectum cancers with nitrate levels in public water supplies. Two lifestyle associations were found for colon cancer:

- "...nitrate exposure (>10 years with average nitrate > 5 mg/L) was associated with increased colon cancer risk among subgroups with low vitamin C intake (Odds Ratio = 2.0; CI = 1.2-3.3) ..."
- "A positive interaction was also observed ($p < 0.05$) between high meat intake and longer duration nitrate-nitrogen levels greater than 5 mg/L."

The study concluded, "...any increased risk of colon cancer with nitrate in public water supplies might occur only among susceptible subpopulations." Further research was indicated.

¹De Roos A et al. *Nitrate in public water supplies and the risk of colon and rectum cancers. Epidemiology* 2003; 14(6): 640-649.

Food Safety and Fresh Fruits & Vegetables

In response to recent foodborne illnesses in the news, The Council for Agricultural Science and Technology¹ has recommended actions to decrease the risk from disease-causing bacteria on fruits and vegetables. Quoted from the *CAST Commentary* are the following recommendations:

- Wash produce with clean water before eating (do not use household soaps or other cleansers).
- Scrub firm produce, such as melons and cucumbers, with a produce brush during washing.
- Cut out damaged or bruised area before eating.
- Control temperature of produce to prevent microbial growth.
- Refrigerate fresh produce that requires cool temperatures (below 45° F, 7°C).
- Avoid leaving cut melons at room temperature for more than two hours.
- Wash hands and food preparation surfaces often.
- Avoid cross contaminating ready-to-eat foods with raw meat, poultry, or seafood.

"These techniques are highly recommended to enhance the safety of fresh produce, but may not be sufficient to remove all pathogens present."

¹Brandenberger L et al. *CAST Commentary: Food safety and fresh produce. December 2003.*