

Peroxide + Catalyst = Cleaner Water

Combining hydrogen peroxide with an enzymelike catalyst called Fe-TAML—for iron tetra-amido macrocyclic ligand—produces a reaction that breaks down environmental pollutants, such as dyes and pesticides. Recent tests have shown that it also breaks down estradiol, a natural form of the female hormone estrogen, as well as ethinylestradiol, a synthetic version that's used in contraceptives.

Fe-TAML was developed with Carnegie Mellon University's Institute for Green Oxidation Chemistry in Pittsburgh, Pennsylvania.

Wastewater treatment plants remove most pollutants, but ethinylestradiol is more resistant than estradiol to degradation by microbes and other natural processes. Discovery of Fe-TAML's effectiveness coincides with growing concern about contamination of surface and groundwater by hormones—whether flushed into sewage or excreted by livestock. Lab experiments have shown Fe-TAML to degrade more than 95



percent of both forms of estrogen within 5 minutes of exposure to the reaction. Next will be studies to determine effectiveness of the reaction in effluent from hog-farm lagoons. *Nancy W. Shappell, USDA-ARS Red River Valley Agricultural Research Center, Fargo, North Dakota; phone (701) 239-1233, e-mail shappeln@fargo.ars.usda.gov.*

Heralding a New Barley

A new feed barley that's especially eco-friendly is now available to seed companies and plant researchers. Named "Herald," it's the first commercial-quality barley that provides a greater proportion of its phosphorus in a bioavailable form that can be more readily absorbed and used by fish and nonruminant livestock, such as pigs. While tests have shown it to have

about 10 percent less total phosphorus than top-yielding feed barleys, it has more than three times as much phosphorus in a bioavailable form. This means that less of it will be excreted in livestock manure and carried away in runoff from pastures or fields into waterways.

The superior bioavailability of Herald's phosphorus would spare growers the feeding of supplemental phosphorus needed for their animals' health. And its excellent yield would further guarantee their savings. Seed can be requested—by researchers or seed companies—from the Foundation Seed Program in Kimberly, Idaho. *Phil Bregitzer, USDA-ARS Small Grains and Potato Germplasm Research Unit, Aberdeen, Idaho; phone (208) 397-4162, e-mail pbregit@uidaho.edu.*

Strides Made Toward a New Marek's Vaccine

Holding the line against tumor-causing Marek's disease has required the nonstop diligence of poultry researchers. That's because, despite development of the first vaccine against Marek's in 1972, emerging strains have continually challenged each new update that's been devised to keep

the disease at bay.

Now, improved versions of the first genetically engineered Marek's vaccine are being tested. These experimental recombinant DNA vaccines should provide protection longer than previous versions. The hope is that they will maintain their effectiveness long enough for poultry researchers to breed a first generation of Marek's-resistant birds using modern genetic techniques made possible by mapping of the chicken genome.

Nineteen lines of chickens specially bred to make identification of disease-resistance genes easier are the newest additions to a unique gene pool maintained since the 1930s. It comprises more than 50 inbred lines of chickens that are carefully quarantined and protected for use in a



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variety of research projects. *Aly M. Fadly, USDA-ARS Avian Disease and Oncology Laboratory, East Lansing, Michigan; phone (517) 337-6829,*

Nutrient-Loaded Mushrooms

Who'd have thought that the often-overlooked culinary mushroom offered consumers key nutrients like copper, potassium, folate, and niacin? That's what nutrient analysis of seven varieties of mushrooms—crimini, enoki, maitake, oyster, portabella, shiitake, and white button—has shown. Samples gathered from markets countrywide have been analyzed for their carbohydrate, fat, fiber, protein, vitamin, and mineral contents, along with ergosterol, a precursor to vitamin D.

Four varieties were analyzed raw, but portabella, shiitake, and white button mushrooms were analyzed after cooking—to determine the effect of cooking on their nutrient content. Most nutrients were fully retained, while a few dropped to 80-95 percent.

All mushrooms were found to provide a significant amount of copper, a trace element that helps the body produce



red blood cells and drives a variety of chemical reactions that are key to human health. They also provide significant amounts of potassium, which helps maintain normal heart rhythm, fluid balance, and muscle and nerve function.

The data is available at www.ars.usda.gov/nutrientdata. *David B. Haytowitz, USDA-ARS Nutrient Data Laboratory, Beltsville, Maryland; phone (301) 504-0714, e-mail haytowitz@ba.ars.usda.gov.*