The Engineered Meal (Winter 2006)
Course Proposal
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Course Title: The Engineered Meal: Biotechnology and Agriculture

Course Description:
This course is designed to offer members of the public an introduction to DNA and provide science-based information on the use of biotechnology in agriculture today. Each session will include a one hour lecture followed by a one hour laboratory in which participants will test common grocery store foods for genetically modified ingredients. This course will be offered in three sessions and will include basic lab work. No previous background in DNA or lab experience is required, just a willingness to explore new topics, learn vocabulary, try hands-on activities, and ask questions. Participants will get to explore several crucial techniques which have revolutionized the study of DNA. We will be using laboratory kits and equipment designed for use by high school and college students. Each session builds upon the previous session, so participants should sign up for all three sessions.

Get ready to be a DNA scientist for 3 weeks. You will love explaining to friends and family members how you ground up corn chips to test for genetically engineered ingredients!

Registration will be required and the course will be limited to 16 participants. The class will be held on the OSU campus from 9:30-11:30 a.m.

Session 1: What is DNA?
Lecture (1 hour): Participants will be introduced to the ABC's of DNA, including the basic structure of DNA, its building blocks, and how these building blocks allow DNA to function as a genetic code in all organisms. We will cover the basic vocabulary, biology, and chemistry of DNA.

Lab (1 hour): In preparation for the lab in session 2, participants will isolate DNA from common grocery store foods such as corn meal, veggie burgers, corn chips, and papaya (did you even know that there is DNA in your food and that you can isolate it from the starch and protein?). All materials including foods and mortars and pestles for grinding will be supplied.

Session 2: Zooming in on a DNA Sequence or "Gene amplification"
Lecture: In this session, participants will learn how scientists can "zoom" in on a small region of DNA and make enough copies of this region to study further. We will be looking for DNA sequences which have been added to corn and soy bean plants during the process of genetic engineering. During the introduction to the lab, participants will learn how a technique called the Polymerase Chain Reaction (PCR) has revolutionized science and the study of DNA. The polymerase chain reaction is widely used in

forensics, disease diagnosis, environmental monitoring, genetic engineering, and many other areas.

Lab: Students will set up the reactions which will be used to analyze the DNA extracted from the foods in Session 1 to determine if genetically modified ingredients are present. Think of this as a micro-cooking experiment. You will be mixing small quantities of different ingredients. Participants will be working with the same kind of lab equipment and materials a molecular biologist would use in the lab.

Session 3: Genetic Engineering and Biotechnology

Lecture: Learn about how genetic engineering and biotechnology is being used in agriculture today. Instructors will cover the basic methods of genetic engineering and introduce participants to what products are available and in development.

Lab: A procedure called gel electrophoresis will be used to look for DNA sequences produced in the PCR reactions from Session 2.