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# Press Release

Freising-Weihenstephan, 25 March 2009

**Long-term study proves:**

## Feeding cows with the genetically modified corn MON810 does not alter their milk

**Is it safe to feed genetically modified corn to animals that supply us with food? Many consumers are skeptical. After a long-term feed study lasting more than two years, molecular biologists at the Technische Universitaet Muenchen (TUM) have answered this question, at least in the case of dairy cows: According to this study, the genetically modified corn MON810 is digested in exactly the same way as traditional corn, and there are no indications that transgenic components are transferred into the milk.**

The abbreviation MON810 stands for transgenic corn: A gene from the soil bacterium *bacillus thuringiensis*, called *cry1AB-Gen*, was spliced into the genetic material of a corn variety. This originally foreign gene induces the corn plant to produce a protein that kills its deadliest enemy – the European Corn Borer butterfly, which is also widespread in Bavaria. Advocates consider this GM corn to be an elegant way of dispensing with traditional insecticides. Opponents, however, are skeptical. They fear that the Cry1Ab protein that is toxic to the corn borer will also harm humans and mammals. A team working with Professor Heinrich H.D. Meyer from the TUM Department for Physiology made these reserves the research issue at the core of a feed study undertaken with colleagues from the Bavarian State Research Center for Agriculture (Landesanstalt fuer Landwirtschaft, LfL) from May 2005 onwards. How are the Cry1Ab protein and the *cry1Ab* DNA from transgenic corn broken down by dairy cows?

In order to compare fodder types, the LfL grew traditional and transgenic corn especially for the study. They were separate, but grown under the same conditions. Subsequently, large quantities of the GM corn were fed to 18 dairy cows on a fixed schedule for 25 months at the Institute experimental station in Grub near Munich. A control group of another 18 cows were fed the same quantities of conventional corn fodder. Every month over the two year period, the researchers took samples of blood, milk, and feces. They also took samples of each fodder type every week. For the analysis, they developed special DNA extraction methods and an especially sensitive way of detecting the Cry1Ab protein. "With these improvements in the methodology, we were

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able to set the limit of detection much lower than scientists have accomplished to date," as Professor Meyer emphasized.

In total, the researchers from the TUM and the LfL analyzed over 38,000 datasets from 36 dairy cows. The analysis revealed that first of all, it makes no difference to the physical development of the animals which of the corn varieties is fed to them. Irrespective of what the animals ate in the long-term experiment, milk output, condition and weight remained comparable in all 36 animals. Even on closer investigation, their health and fertility, which were tested with various metabolic parameters and the amount of pregnancy hormones, remained stable. Despite the relatively high intake of Cry1Ab protein of around 5.3 mg per day, neither the organ function nor the fertility of the cows fed with GM corn were seen to be any different from the control group.

However, is it perhaps possible for the Cry1Ab protein, or the *cry1Ab* DNA from the genetically modified corn to pass into the cow's organism and therefore also into its milk? According to the data, this is not the case: The protein is no more stable in animals than other proteins; on the contrary it is more easily digested. None of the 450 blood samples showed that the foreign *cry1AB* DNA or the Cry1Ab protein transferred from the GM corn to the animal. A total of 900 milk samples from both trial groups confirmed the findings: The milk from the cows was not distinguishable at any time, not even with the best technology currently available. Professor Meyer is convinced: "The results of our study do not reveal any potential for harm from the genetically modified corn MON810 fed to dairy cows."

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**Illustrative material**
There is a collection of free photographs available for download at
http://mediatum2.ub.tum.de/?cunfold=685243&dir=685243&id=685243

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**Background:**
The research project "The use of transgenic corn (MON810) in dairy cows: Breakdown, transfer, and potential interactions of DNA and Bt protein in cattle" was funded by the Bavarian Ministry for Food, Agriculture and Forestry and carried out by the Center of Life and Food Sciences Weihenstephan of the TU Munich with the Bavarian State Research Center for Agriculture.

The Technical Committee for Food, Agriculture and Forestry at the Bavarian *Landtag* was informed about the results of the study on 25 March 2009. On 21 April 2009, the TUM and the Agricultural Institute will be holding a joint symposium at which the subject will be discussed in detail. Invitations to this event will be issued separately in advance.

With around 420 professors, 6,500 employees (including at the "Rechts der Isar" Clinic), and 23,000 students, the **Technical University in Munich** (TUM) is one of the leading universities in Europe. Its main areas of focus are the engineering sciences, natural sciences, life sciences, medicine and economic science. After having received numerous awards, it was selected by the Scientific Council and the German Research Foundation to be a "University of Excellence" in 2006. The TUM's global network extends as far as an outpost in Singapore. The TUM is committed to the principles of the "Entrepreneurial University".

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