Biological effects

of transgenic maize NK603xMON810 fed

in long term reproduction studies in mice

Regulation in the EU and current state of risks (problem cases)

Regulierung in der EU und Stand der Risiken (Problemfälle)

Daniel Ammann, Schweizerische Arbeitsgruppe Gentechnologie SAG

5. Europäische Konferenz der gentechnik-freien Regionen

Food and Democracy, 24./25. April 2009, Luzern

Gesundheitsrisiken von Gentech-Food

Daniel Ammann
Schweizerische Arbeitsgruppe Gentechnologie SAG

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Early warning – Skepsis gegenüber Industriedossiers

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Pusztai-Affäre

- Kartoffeln mit einem Lektin-Gen aus Galanthus nivalis
- Negative Auswirkungen auf Organe von Ratten

Stanley Ewen, Árpád Pusztai: „Effect of diets containing genetically modified potatoes expressing Galanthus nivalis lectin on rat small intestine“, 16. Oktober 1999, The Lancet, Vol. 354, S. 1353

Commission du génie biomoléculaire française

- MON863 und MON863xMON810 (Monsanto)
- Negative Auswirkungen auf Organe und Blutbild von Ratten?

Kempf, H. (2004). L‘expertise confidentielle sur un inquiétant mais transgénique. Le Monde, 22.4.2004

Fütterungsstudie mit transgenen Erbsen an Mäusen

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- Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- Transgene Erbsen mit Resistenz gegen den Erbsenkäfer *Bruchus pisorum*
- Transfer Bohnen-Gen (Alpha-Amlyase-Hemmer) in Erbgut der Erbsen.
- Fütterungsversuche an Mäusen: Starke Immunreaktion
- Hypothese: Amylase-Hemmer in Erbsen wird mit anderen Zuckern verknüpft als in Bohnen.

Fütterungsstudie mit MON810 an Mäusen

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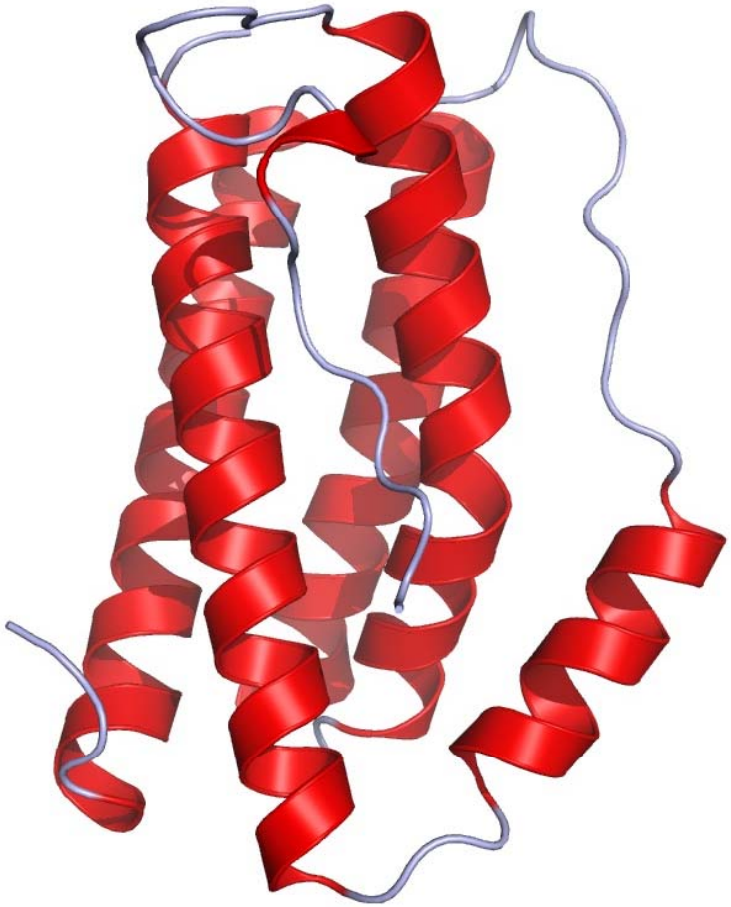

Kristallstruktur des humanen Interleukin-6
(reguliert Entzündungsreaktionen des Organismus)

Finamore, A. et al. (2008). Intestinal and Peripheral Immune Response to MON810 Maize Ingestion in Weaning and Old Mice. *J. Agric. Food Chem.*, Vol. 56 (23), S. 11533-11539.

Signifikante Veränderungen im Immunsystem:

Fütterung junger Mäuse mit MON810: Konzentration an Cytokinen wie Interleukin-6 nimmt gegenüber der Kontrollgruppe deutlich zu

Fütterungsstudie mit MON810 an Mäusen

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Table 3. Serum Cytokine Levels of Weaning and Old Mice Fed MON810 (GM) or Parental Control (C) Maize for 30 or 90 Days[a]

	pg/mL										
treatment	IL-4	IL-5	IL-6	IL-10	IL-13	IL-12p70	IL-21	TNF-α	IFN-γ	MIP-1β	MCP1
weaning, 30 days											
C	2.6 (0.3)	2.9 (0.3)	4.3 (1.7)	9.1 (2.3)	2.9 (1.2)	7.0 (0.8)	9.3 (0.7)	14.3 (2.3)	2.1 (0.2)	24.9 (5.1)	39.4 (6.7)
GM	2.8 (0.5)	3.3 (0.5)	20.6 (8.1)*	12.0 (3.9)	6.5 (0.8)*	9.7 (2.9)*	8.1 (3.0)	17.9 (6.6)	2.2 (0.4)	33.0 (6.2)*	60.5 (29.5)
weaning, 90 days											
C	2.6 (0.5)	3.2 (0.5)	3.8 (0.6)	10.2 (3.2)	6.9 (2.7)	8.4 (2.2)	8.6 (0.5)	15.6 (5.2)	2.3 (0.5)	23.3 (3.2)	42.5 (13.4)
GM	2.7 (0.3)	2.9 (0.5)	6.7 (4.7)	9.1 (2.0)	5.6 (1.9)	9.2 (4.0)	10.5 (7.4)	16.8 (2.6)	2.3 (0.6)	32.2 (6.7)*	38.3 (3.2)
old, 90 days											
C	3.2 (0.5)	3.3 (0.6)	5.7 (1.1)	13.1 (1.9)	6.5 (4.1)	10.7 (2.8)	9.4 (3.5)	17.6 (4.1)	2.4 (0.5)	27.0 (5.3)	49.4 (14.5)
GM	2.6 (0.9)	3.4 (0.8)	5.3 (2.8)	11.6 (4.4)	6.3 (1.1)	12.1 (3.1)	7.9 (2.2)	20.6 (5.7)	2.2 (0.7)	39.7 (13.4)*	41.0 (15.9)

[a] Data are the means ± SD (in parentheses). For each column, $P < 0.05$ as compared to C.

These cytokins (IL-6, IL-13, IL 12p70, MIP-1β) are involved in allergic and inflammatory responses, and although they were not strongly elevated by MON810 maize consumption, their increase is a further indicator of immune perturbations induced by MON810 maize.

Fütterungsstudie mit MON863 an Mäusen: Neubewertung der Monsanto-Daten

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Séralini, G.-E. et al. (2007). New Analysis of a Rat Feeding Study with a Genetically Modified Maize Reveals Signs of Hepatorenal Toxicity. Arch. Environ. Contam. Toxicol., Vol. 52, S. 596–602.

Signifikante Veränderungen von Parametern in der Leber und der Niere:

Beispiel: Triglyceride nehmen in weiblichen Ratten um 40% gegenüber der Kontrollgruppe zu.

Fütterungsstudie mit MON863 an Mäusen: Neubewertung der Monsanto-Daten

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Table 2. Differences between GMO–fed rats and controls

	Week	m 11%	m 33%	f 11%	f 33%
Liver parameters					
Albumin/globulin ratio	5	11*	-3	-9	4
Albumin/globulin ratio	14	6	-2	-18**	7
Albumin	5	-3	-2	-2	5*
Albumin	14	-2	3	-6*	5
Globulin	5	-12*	2	9*	1
Globulin	14	-8	7	15*	-2
Alanine aminotransferase	14	-30*	-8	37	4
Total protein	14	-5*	5*	1	3
Triglycerides	5	22	-2	-11	40**
Triglycerides	14	15	-1	24*	6
Liver weight	14	-1	-2	7**	6
Liver/brain ratio	14	-1	-3	6*	4
Kidney parameters					
Creatinin	14	-7	13*	13*	-2
Urine sodium	14	-23	-25*	11	-26
Urine sodium excretion	14	3	-35*	35	-24
Urine chloride excretion	5	35	3	50*	67*
Urine potassium	5	35*	-20	-3	-13
Urine phosphorus	5	3	-35*	24	-15
Urine phosphorus	14	-34	-31*	12	-8
Urea nitrogen	14	-8	4	17*	-1
Kidney weight	14	-3	-7*	3	2
Kidney/brain ratio	14	-3	-7*	1	1
Kidney % body weight	14	-1	-5*	-1	-1
Pancreas					
Glucose	14	-4	9	9*	10**
Bone marrow					
Neutrophils	5	5	22*	-14	3
Eosniophils	14	32	54*	20	0
Reticulocytes	14	15	-17	-35	-52*
Reticulocytes % RBC	14	16	-16	-36	-55*

"In conclusion, the two main organs of detoxification, liver and kidney, have been disturbed in this study.

(…)

we strongly recommend a new assessment and longer exposure of mammals to these diets, with cautious clinical observations, before concluding that MON863 is safe to eat."

Arpad Pusztai
Genetically Modified Foods:
Are They a Risk to Human/Animal Health?

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Genetically modified (GM) crops and food are being grown and consumed by the public, even though:

- there is little scientific study about their health risks

- safety test technology is inadequate to assess potential harm

- they can carry unpredictable toxins

- they may increase the risk of allergenic reactions

Bedarf zur Bewertung von Gentech-Lebensmitteln

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Mehr unabhängige Studien

Verbesserte wissenschaftliche Bewertung

Mehr Langzeit-Fütterungsversuche

Monitoring von Langzeiteffekten bei Konsumenten

Probleme Fütterungsversuche

Fütterungsversuche stellen höchste Ansprüche an die Forscher (Versuchs-Design).

Fütterungsversuche sind sehr teuer.

Fütterungsversuche können nicht wiederholt werden.

Fütterungsversuche sind schwer interpretierbar (negative Langzeiteffekte, unerwartete toxische Produkte, Allergien).

Die beste Lösung: Gentechnikfreie biologische Lebensmittel

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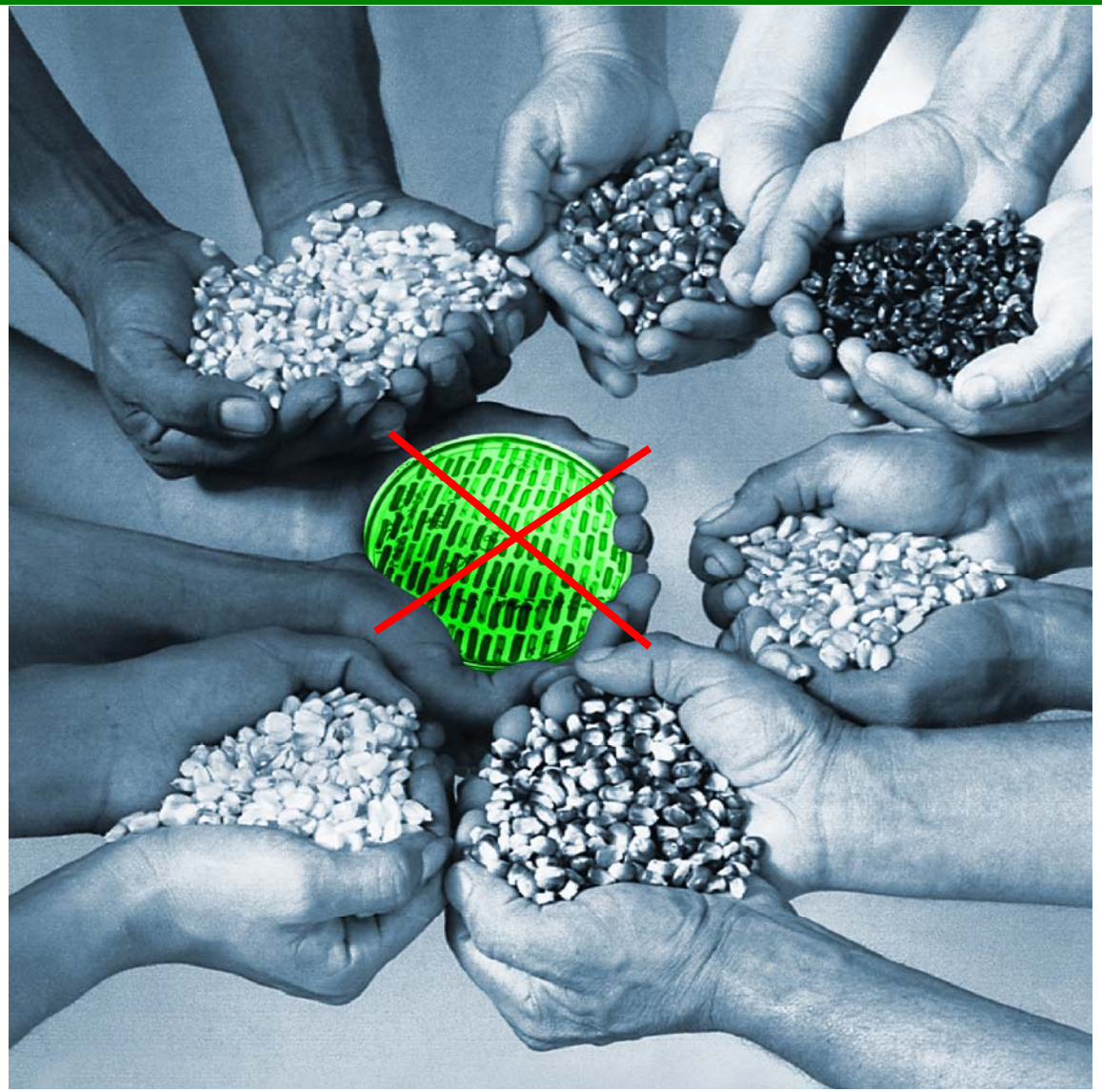

Mehr Information an dieser Konferenz: Workshops B2 und B3

Food and Democracy, 24./25. April 2009, Luzern

Samstag, 25. April 2009
9.00 – 15.00h

B2: Gesundheitsrisiken von GM Nahrung und Umweltrisiken in der Landwirtschaft: Stand der Diskussion

Samstag, 25. April 2009
9.00 – 11.30h

B3. Biolandbau und Vielfalt der Ernährung