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Lab rat diets contaminated: chemical and GMO safety tests invalid

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A new French study has shown that feeds commonly used as standard diets in safety tests performed on rats, are contaminated with hazardous substances and often also with genetically modified organisms (GMOs). This may help to explain the common problem hindering safety tests that the rats used often develop health problems even without being exposed to the tested substances. Chemicals and GMOs subjected to such safety tests are often authorised despite this problem. The new findings raise doubts about the validity of these safety tests, and consequently about the safety of the products tested, including a range of chemicals and GMOs.

The research group of Gilles-Eric Séralini of the University of Caen, supported by the CRIIGEN association, found that 13 commonly used lab rat diets from five continents were all contaminated with pesticides (1-6 out of 262 measured), heavy metals (2-3 out of 4), polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs, 1-13 out of 17) and polychlorinated biphenyls (PCBs, 5-15 out of 18). Chronic consumption of these diets, considering all contaminants together, has a very high hazard index, meaning that these standard diets are likely to cause serious diseases and disrupt the hormonal and nervous system of the animals.

Moreover, genetically modified organisms (GMOs) that have been authorised in the EU were found in 11 out of these 13 diets. Mainly GM soy and maize varieties were found, at levels from 0.3 to 48% of the diets.

The study was carried out to investigate the high background rate of health problems commonly found in lab rats. For instance, many spontaneously develop tumours or have kidney problems. This is often considered an unavoidable fact and sometimes thought to have a genetic cause. The new study suggests, however, that this may be a dietary problem rather than a genetic one. DuPont, for instance, tested a GM Roundup-tolerant oilseed rape and found it to be safe when compared to their control diet. However, the new study found that the control diet used by DuPont contained significant amounts of GMOs, including 18% of Roundup-tolerant maize, and

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Roundup residues at levels known to cause toxic effects. This largely invalidates the conclusion of the DuPont study that the oilseed rape is safe, as the proper GM-free diet for comparison is missing.

The French study also means that the use of so-called historical data in safety tests can produce false negative results. Historical data are the collection of all health data of lab animals that have been gathered in the past. These data are often used as external and secondary controls in new regulatory safety studies, to discuss the biological relevance of statistically significant differences observed between the exposed and the control animals within the study. If the effect found falls within the boundaries of the historical data, it is considered to have a genetic or otherwise natural origin. Thus, the effect is considered as not related to the chemical or GMO in question. The new French study reveals, however, that many pathological effects in historical data may be caused by contamination of the control diets with hazardous chemicals or GMOs. The authors therefore conclude that historical control data are unsuitable for use as secondary external controls.

In general, this increased background of harmful health effects among lab rats raised on control diets confounds the testing of substances for their toxicity or carcinogenicity. It is much more difficult to establish the effect of the exposure in face of high control effects. Therefore, the safety of many chemicals and GMOs tested this way and subsequently authorised, is now shrouded in great uncertainty. On the basis of this new research, scientist and ENSSER member Professor Thomas Bøhn (GenØk – Centre for biosafety, Tromsø, Norway) suggests: “All tests for chemical and GMO safety should now include analysis of the standard control diets for contaminants if they are to be judged as valid and legitimate”.

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