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## Irradiated grains: health risks

### Toxicity well known

The toxicity of irradiated foods was never a secret. Around 1970 two extensive review articles on this issue had appeared (1, 2). They mentioned researches with human cells.

In one research sucrose solutions irradiated with 20 kGy were added to cultures of human lymph cells. After 72 hours at 37 EC it was found that the lymph cells were inhibited in their cell divisions, that chromosomes (carriers of the genetic code) were grossly damaged and that four times endoreduplication occurred (3).

A similar research was done with irradiated culture medium. Here a batch of culture medium was irradiated with 10 and 50 kGy. Then, white blood cells of four healthy human males were grown on them. And here too was found: inhibition of cell divisions, chromosome fragmentation and polyploidy (2, 4).



### Endoreduplication / polyploidy

Endoreduplication is caused by a blocking of the last stage of a cell division. The chromosomes have reduplicated themselves, but the cell does not split in two parts, each with a normal set of chromosomes. So, you end up with one large cell with a double set of chromosomes. This situation is called endoreduplication or polyploidy. Its normal level is a fraction of one percent. People undergoing radiation treatment find in general an upsurge of polyploid lymph cells in their blood.

### 'Expert' recommendation

Nonetheless a Joint FAO/IAEA/WHO Expert Committee of 1969 recommended a temporary clearance for irradiated wheat. And yes, further studies were recommended focussing on the possible generation of mutation effects from irradiated wheat. They clearly thought that this would only rubber stamp the given clearance. Else they would have recommended further trials only and additional recommendations would depend on the outcome of these trials. At this stage the National Institute of Nutrition in

India stepped in.

### National Institute of Nutrition

Indian researchers were well aware that the feeding studies with irradiated food had been carried out with well-nourished animals. But as they realised that in many countries malnutrition is widespread, they wondered how malnourished people would cope with irradiated food. So they researched this with children suffering from kwashiorkor, which is a severe lack of protein.

### Feeding experiments: children (5)

Ten children were divided in two groups of five. Before the trial started blood samples were taken and examined as the starting point for each child. One group of five children was the control group. The other group was the experimental group. The diets given to the children were identical except for the fact that the wheat for the experimental group had been irradiated with a dose of 0.75 kGy, the dose recommended for grain disinfestation.

After four weeks blood samples were taken of all children and examined. In four of the five children given freshly irradiated wheat polyploid lymph cells were found. Other abnormal cells were also present.

After six weeks again blood samples were taken and a sharp increase of polyploid lymph cells compared to the level at four weeks was found. To protect the children from eventual harm it was decided to halt the trial at this stage. The control children did not have any abnormal cells in their blood during the trial.

It was realised that freshly irradiated wheat could distort reality too much. So, instead of wheat fed within 2 to 3 weeks of irradiation, it was first stored for 12 weeks before it was used in the diet of a new group of five children. This time the polyploid cells showed up for the first time after six weeks.

After the irradiated wheat had been withdrawn, it took 24 weeks before the blood of the children fed irradiated wheat reverted to normal and all abnormal cells had completely disappeared. To verify their results they continued with experimental animals.

### **Monkeys:**

The trial of the children was repeated with the same results: a progressive increase of polyploid lymph cells and a gradual disappearance of these cells after the withdrawal of irradiated wheat (6).

### **Rats and mice (7, 8, 9, 10)**

Here a number of other investigations was done. And so it was found that in animals fed irradiated wheat there were:

- increased polyploid cells in the bone marrow
- increased numbers of intra-uterine deaths
- decreased numbers of germ cells in the testis
- depressed immune response

### **The reaction: fake trials and foul play**

The proponents of food irradiation were enraged. So far they had successfully pretended that yes, there were some adverse affects in animals fed irradiated food, but the irradiation dosages in those trials had been excessive. So, irradiated food would be safe in practice they had asserted. Had they not already been given temporary clearance for irradiated wheat? And now the (Indian) National Institute of Nutrition (NIN) pulled the rug from under them. Their findings indicated clearly that irradiated wheat was not safe.

So, a number of fake trials were carried out with generous amounts of anti-oxidants added. The pretense was that these trials duplicated NIN's research, while in actual fact the diets were quite different. So, it was suggested that through these fake trials NIN's research was not good.

In addition almost every trick in the book was used to discredit NIN. "Expert committees" were set up to have a closer look at this NIN research. The first thing they did was to misrepresent and distort NIN's findings. Then it was pretended that the trials had not been designed well without indicating what was wrong and what design should have been used. Then it was rumored that the NIN data were fraudulent and that NIN had withdrawn them. So, NIN had to declare that they stood by their data and considered them valid.

Perhaps the most silly allegation was that the upsurge in polyploid lymph cells was transient. In fact, the sharp upsurge of polyploid cells with continued feeding clearly indicated that the toxic agents were building up inside the body, nothing transient there.

If anything, then the sorry saga around the research of the National Institute of Nutrition concerning irradiated wheat, shows that the nuclear lobby is hell bent on imposing irradiated food on the population, no matter what.

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