



# GE Free New Zealand

*In Food And Environment Inc.*

PO Box 13402, Wellington, NZ

23 January 2018

Dear Jenny,

Thank you for meeting with us. The reasons for this meeting relate to the draft approval of A1138 Pro vitamin A rice GR2E line. This application raises many concerns regarding the safety of A1138 Provitamin Rice.

GE Free NZ is an organization whose membership represents a wide range of the community. All who are consumers, so the safety of the food they eat is of paramount importance and often the main concern for our consumer families and members.

GE Free NZ is calling on the Food Regulation Standing Committee (FRSC) members, MPI, and Minister for Food Safety, Hon Damien O'Connor, as a member of the Ministerial Council to instruct Food Standards Australia New Zealand (FSANZ) to review the draft of their GM rice approval (A1138), under sec: 21 of the FSANZ Act.

As this food is only going to be approved on the basis of it contaminating the rice supplies means there are real dangers from the unknown risks that will not be able to be traced. This does not uphold the duty of care that the Minister and Forum members have to the public.

There are three new proteins expressed in the Rice event GR2E and these proteins have changes that are potentially toxic, allergenic or have sub chronic histological effects.

**The unintended effects of GR2E regarding the PMI protein.** The applicant detailed alterations to the proteins expressed and stated that these changes had not been assessed by FSANZ. FSANZ acknowledged in their Supporting Document 1 that the PMI protein was different to the ones assessed in the maize (p.23 footnote 8). The protein changes caused by the PMI in rice might be similar to the MIR162, line 3272 and line 5307 but the MIR162 line did not produce alterations to the proteins in the maize in the way the PMI protein in the rice has done. Therefore these new proteins need to be tested for as stated in the Codex guidelines.

**Regarding, similarity of LAAO to snake venom,** the LAAO enzyme has a myriad of biological activities including apoptosis-induction, edema-induction, hemorrhaging, and inhibition or induction of platelet aggregation. As the control rice does not contain LAAO it is not acceptable to bring in a wild rice that may not be eaten by the population. This misleads and dismisses the serious nature of the presence of the toxic similarities to snake venom of these LAAOs. There needs to be feeding tests undertaken on the GR2E rice on consumption.

Dr. Pusztai an expert on plant lectins and author of over 700 research papers and books. His research on GM potatoes, comparing the isolated snowdrop lectin (GNA) as a powder with the

transgenic GNA expressing potatoes, found there were significant differences in the rat intestines<sup>1</sup>. So regarding the microbial expressed CRTI that was isolated and fed to rats there is a strong possibility that the transgenic carotene CRTI expressed in GR2E would have similar differences to Puztai's potatoes. Further, Poulsen *et al* (2007) conducted GM rice studies over 90 days and found significant changes, affecting the liver and kidneys, with immune system depression; the study could not verify the safety of the rice<sup>2</sup>. As there are no feeding studies required or provided, ingesting this rice could be a health hazard for all consumers.

The EU guidelines for any transgenic food that has significant biological/nutritional/toxic changes compared to its conventional comparator require a 90-day oral feeding test<sup>3</sup> (p.32-33).

**As there is an absence of feeding studies and published data on A1138**, and considering this rice has significantly altered, potentially toxic and allergenic properties. Especially as babies are high consumers of rice based foods and as rice allergy is relatively uncommon<sup>4</sup> it is a safe baby food. It is essential that this rice does not increase the hazard levels anaphylaxis, allergies and gut disorders.

There is no safety data asked for or provided, to show if this rice is safe to eat. The levels of vitamin A are greatly over-estimated, the amount of beta carotene in GR2E, given that it was based on the 7.31ug/g from a one-off trial site, frozen dry rice, tested in low light. The average from the trial plots was 3.57 ug/g, not the 7.31 ug/g used in the 'maximum consumption' estimate.

Furthermore, we now know that degradation of the beta-carotene in Golden Rice follows a half-life of 25 days, with 87% of the 3.57 ug/g being lost after 75 days, before plateauing<sup>5</sup>. NB: The initial figure of 30 ug/g shows this was the pre-back-crossed grain, line R probably, not GR2E.

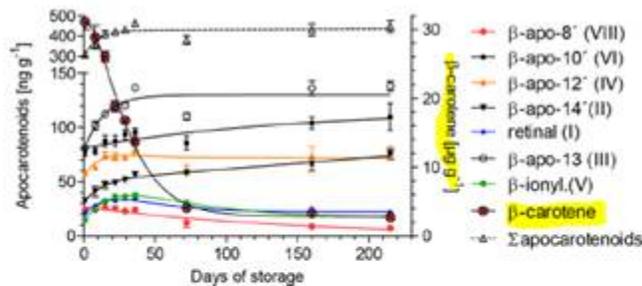


Figure 4. Time course of  $\beta$ -carotene-derived apocarotenoid formation in an experimental (cv. Kaybonnet) GR line. Sampling and analysis were performed as outlined in the [Methods](#) section.  $\beta$ -Carotene decays during early phases with a half-life of 25 days, followed by a plateau. Note that  $\beta$ -carotene is given in  $\mu\text{g g}^{-1}$  (right axis), while derived apocarotenoids are given in  $\text{ng g}^{-1}$  (left axis). Roman numerals of cleavage products refer to [Figure 1](#). Data represent the mean  $\pm$  SEM of three technical replicates.

<sup>1</sup> [http://www.thelancet.com/ndfs/journals/lancet/PIIS0140-6736\(98\)05860-7](http://www.thelancet.com/ndfs/journals/lancet/PIIS0140-6736(98)05860-7) ndf

<sup>2</sup> Poulsen M, Kroghsbo S, Schroder M, et al. A 90-day safety study in Wistar rats fed genetically modified rice expressing snowdrop lectin *Galanthus nivalis* (GNA). *Food Chem Toxicol.* Mar 2007; 45(3): 350-363. <http://www.sciencedirect.com/science/article/pii/S0278691506002559?via%3Dihub>

<sup>3</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0503&from=EN>

<sup>4</sup> <http://www.swallergy.com/rice-allergy.html>

<sup>5</sup> Schaub, P., Wüst, F., Koschmieder, J., Yu, Q., Virk, P., Tohme, J., & Beyer, P. (2017). Nonenzymatic  $\beta$ -Carotene Degradation in Provitamin A-Biofortified Crop Plants. *Journal Of Agricultural And Food Chemistry*, 65(31), 6588-6598. <http://dx.doi.org/10.1021/acs.jafc.7b01693>

At 3.57ug/g – eaten immediately after harvest in low light – a consumer needs to eat 4kg of cooked rice, When processed, imported and shelved, which could take up to 75 days, the levels of beta carotene are so low that 31kgs of cooked rice will be required, compared to what one medium carrot provides.

Golden Rice (max possible)	7.31 ug/g	dry rice
Child rice consumption	12.5 g/kg	
Adult weight	57.7 kg	
Rice consumption/day	721 g dry or	1967 g cooked
Max possible b-carot	5272 ug or	5.272 mg
b-carot concentration in carrot	82.9 ug/g	(IRRI numbers)
medium carrot (I weighed one)	62 g	
b-carot in medium carrot 62*82.9	5140 ug	or 5.140 mg
Golden Rice (ave. freezer, no O2, low light)	3.57 ug/g	
b-carot in medium carrot	5140 ug	
dry rice needed for equivalent	1440 g	
cooked rice equivalent	3927 g or 3.9 kg	
Golden Rice (75 days)	0.45 ug/g	
b-carot in medium carrot	5140 ug	
dry rice needed for equivalent	11422 g or 11.4 kg	
cooked rice equivalent	31152 g or 31.2 kg	

(Schaub P. (2017))

We would like the FSANZ Forum members at MPI to reflect our concerns and our recommendations to the Minister, Hon Mr. Damien O'Connor, in their report to him.

We would ask that the Food Regulation Standing Committee (FRSC) New Zealand members, MPI, and Minister for Food Safety, instruct FSANZ to review the decision to approve the Provitamin rice (A1138). We ask that FSANZ requires the applicant to provide comprehensive safety data including 90 day feeding studies that are peer reviewed and published.

Sincerely,  
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