TU037 Development of a refined zebrafish feeding trial to evaluate food safety I. Gabriëls, University of Antwerp / Zebrafishlab Dept Veterinary Sciences; L. Vergauwen, University of Antwerp / Zebrafishlab Dept Veterinary Sciences SPHERE; M. De Boevre, S. De Saeger, Ghent University / Department of Bioanalysis; R. Blust, University of Antwerp; M. Eeckhout, Ghent University / Department of Applied Biosciences; D. Knapen, University of Antwerp / Zebrafishlab Dept Veterinary Sciences; M. De Loose, Institute for Agricultural and Fisheries Research ILVO / Technology and Food Science Unit. Before a *novel food component* can be introduced, a profound *safety evaluation* is required which generally includes a rodent feeding trial to assess potential toxicity. The development of a *zebrafish feeding trial* would advance existing testing strategies by reducing the cost, by replacing the use of mammals by a lower vertebrate species, and by facilitating reproductive and transgenerational studies. When evaluating novel components, part of the food needs to be substituted possibly interfering with nutritional requirements. Therefore, the extent of component substitution tolerable for the zebrafish metabolism should be assessed prior to the evaluation trial. We determined *the maximum tolerable percentage of maize* for adult zebrafish, as maize is a well-known food product for human consumption, but not commonly used in fish feed. Fish were fed for 4 weeks with 6 experimental feeds ranging from 0 to 25% of maize. Growth slightly (2.5%) decreased when fish were fed with 0% or 25% of maize. The hepatosomatic index (% liver weight relative to the total body weight) of males significantly increased when fed with 20% or 25% of maize. Feed digestibility analysis showed a decrease in carbohydrate uptake when fish were fed with an increasing percentage of maize substitution. Based on these results, we selected 15% maize as the maximum tolerable percentage for adult zebrafish. Furthermore, when novel food components are evaluated over multiple generations, the *developing animal model* should receive this component as early as possible during development. Therefore, the next phase of our study was to define the maximum tolerable percentage of maize for *zebrafish larvae*. The *ex utero* development allows us to start feeding with the experimental diets at an early age. Larvae were raised with the experimental diets (0 to 25% of maize) and the relative condition factor, length, general morphology and swimming behaviour were evaluated. In addition, transcription levels of genes encoding enzymes known to be involved in the digestive system (e.g. trypsin) were analysed at different time points during development. We suggest that our approach of determining component substitution rates for adults and, in case of a transgenerational evaluation, for early life stages could be a valuable asset to food safety evaluation trials.