473 Development of a test method for transgenerational effects of genetically modified crops in food using the zebrafish model 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; M. De Loose, Institute for Agricultural and Fisheries Research ILVO / Technology and Food Science Unit; D. Knapen, University of Antwerp / Zebrafishlab Dept Veterinary Sciences. Ever since *genetically modified (GM) crops* were introduced, their safety regarding human consumption has been questioned. One of the main concerns is that the current test method, a 90-day rodent toxicity study, does not specifically assess effects on embryonic development or reproduction. Therefore, the aim of this study is to develop a *new method*, using the zebrafish model, to assess *transgenerational effects* of GM crops in food. Since *GM maize* was selected to develop the method, the first phase of this study was to define the *maximum percentage of maize* tolerable for zebrafish. Fish were fed for 4 weeks with 6 experimental feeds ranging from 0% to 25% *of non-GM maize*. Growth slightly (2.5%) decreased when fish were fed with 0% or 25% of maize. The hepatosomatic index (percentage liver weight/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 outcomes, we selected *15% maize* as the maximum tolerable percentage. Furthermore, it is important that any potential effect of a GM crop is interpreted relative to the *natural variation* that can be observed in response to feeding with non-GM varieties of the *same crop species*. We therefore fed zebrafish for 12 weeks with 10 different non-GM maize varieties (15%). We observed significant differences for the carbohydrate level in the liver of adult males, for the swimming behaviour of adults and larvae, and for the relative condition factor and length of larvae. These results highlight the importance of defining the natural response variation as even feeding with non-GM varieties can cause significant differences. Next, a *transgenerational* experiment was initiated to investigate whether the test system allows us to assess potential transgenerational effects. After 16 weeks of feeding with an experimental and a commercial GM maize and their corresponding non-GM controls (15%), no effects were observed. The variation between the GM condition and their controls was small compared to the natural response variation. Since there is no GMO available that causes known adverse effects due to the genetic modification itself, we opted to expose a subset of every generation to the well-known toxicant cadmium as a positive experiment control to monitor the sensitivity of the zebrafish over different generations.