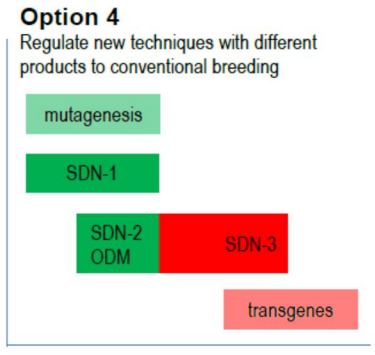
Consultation questions



1. Which option/s do you support, and why?

We support Option 4. This option supports the previous legislation surrounding introduced point mutations or indels regardless of the technology used to make the change. In addition, it would be impossible to identify these changes made by genome editing techniques as opposed to naturally occurring mutations. This would also make reporting easier as you would only need to report when you are introducing a large oligo (almost a transgene). To try to report every allele you generate when making a genome edited K/O fish would be impossible (sometimes up to 30 different alleles in the first-generation fish).

Option 4 is the most practical – options 2-3 are unworkable, because it would be impractical to record and report every single genetically modified organism (many are only kept for a short time prior to screening, and only those organisms that bear the required genetic modification are actually kept – these are the only ones that should be reported upon). Option 1 is not appropriate, with the rapid acceleration in the use of new genome editing technologies, it is important that legislation keeps pace with this technology.

2. Are there other risks and benefits of each option that are not identified in this document?

I think the risks not identified are that it could really matter which genes are targeted. You could do as much damage with a point mutation as you could with a longer oligo. It might be wise to include a clause stating that as long as the intended change does not confer a breeding advantage or make an organism more toxic.

No, there are not any additional risks introduced by these new genome editing tools. In fact, probably the reverse because the specificity and efficiency of these technologies is significantly improved over "blunt" approaches that non-specifically modify the genome (such as chemical mutagenesis).

3. Is there any scientific evidence that any of options 2-4 would result in a level of regulation not commensurate with risks posed by gene technology?

The scientific evidence would be based on the evidence supporting chemical and radiation induced mutagenesis (however, I am unfamiliar with this actual evidence). If there is sufficient evidence that chemical and radiation induced mutagenesis is safe, then there is no reason for options 2 and 3 to be considered as genome editing is much more precise and directed.

There are a few reviews on this topic

4. How might options 2-4 change the regulatory burden on you from the gene technology regulatory scheme?

Option 4 would be in line with how we currently report genome edited materials, based off the transgene inserted.

Options 2 and 3 would require a huge regulatory burden for us. Instead of listing the gene that we were targeting for mutagenesis, we may have to list every allele generated.

Agree with above, options 2 and 3 would be impossible to manage and completely prohibit research. Option 4 would provide a workable model for reporting on these types of genetically modified organisms.

5. How do you use item 1 of Schedule 1, and would it impact you if this item was changed?
We would negatively impacted in the following areas

In-vitro fertilisation of zebrafish embryos
Fish derived from chemical induced mutagenesis

6. Might contained laboratory research on GM gene drive organisms pose different risks to other contained research with GMOs, and how could these risks be managed? Supporting information and science-based arguments should be provided where possible.

n/a

7. What RNA interference techniques are you using, and are there RNA interference techniques that you believe have unclear regulatory status? Please provide details of the techniques and science-based arguments for whether these techniques pose risks to human health or the environment.

We use standard siRNA approaches (which have been around for some years), and I think these are reasonably clear in terms of regulatory status.

8. Do you have proposals for amendments to any other technical or scientific aspects of the GT Regulations? All proposals should be supported by a rationale and a science-based argument.

n/a