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Discussion Group 1

Case study:
Gene drive modified mosquitoes



Network: PULLMAN



@EFSA_EU



European Food Safety Authority

Trusted science for safe food

- Formally devising plausible pathways to harm that describe how a proposed activity could be harmful (i.e., impact a protected value adversely)
- Formulating risk hypotheses (i.e., hypotheses of no harm or of no unacceptable risk) about the likelihood and severity of such events
- Identifying the information that will be useful to test the risk hypotheses
- Developing a plan to acquire new data for hypothesis testing should tests with existing information be insufficient for decision-making

- Mosquitoes are vectors of deadly diseases
- *Aedes albopictus*
 - Highly invasive
 - Transmits several arboviruses (e.g., dengue, chikungunya and Zika)
- Novel control strategies developed and deployed
 - Current control measures not always effective and/or geographically available, and associated with limitations (e.g., resistance development)
- Goal of gene drive modified mosquitoes
 - Reduce size of vector population to an extent that it cannot transmit disease
 - Render mosquitoes less competent to transmit disease

- Biodiversity and ecosystems
 - Toxicity to non-target organisms
 - Alteration of food networks
 - Impact on ecosystem services
 - Niche replacement – mosquito
 - Impact on mosquito fitness
- Human/animal health
 - Accidental exposure leading to toxicity or allergenicity
 - Niche replacement – pathogen
 - Increased vectorial capacity
 - Increased pathology
- Water, soil and air quality, agriculture or natural resources
 - Impact by gene drive modified mosquito larvae or adults
- Management practices
 - Impact on other control strategies
 - Failure of control strategy altering disease incidence

Problem formulation template

Plausible pathway to harm	Testable risk hypotheses (compared with GM insects)	Relevant information to test risk hypotheses	Means to gather relevant information (and feasibility)
Protection goal: ...			
Step1
Step2
Step3
Step4
Step5
Step6
Step7
Step8
Step9
Harm: ...			