

Methods for tier 3 bird & mammal field studies beyond the existing and upcoming EFSA guidance document

INTRODUCTION

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The current EFSA Guidance Document on risk assessment for birds and mammals [1] mentions a variety of different methods for conducting field studies with birds and mammals and many aspects of field study methods are further specified in the drafted revision of the EFSA (2009) Guidance Document [2]. There, these methods are summarised as tier 3 in the stepwise approach of the risk evaluation. However, more methodological approaches for field studies have been developed in recent years. These methods, even if not yet listed in the current and drafted future guidance document (GD), may nevertheless be valuable options for tier 3 field studies. Some of the novel methodological approaches are presented and discussed.

Methods beyond the GD

In the draft revision of the EFSA GD tier3 field study methods are detailed for refined exposure studies (e.g. residues in food items, 'portion of time' (PT) and diet composition (PD)). For field effect studies methods are not yet specified in such detail. Examples of methods to be discussed further and not yet considered in the guidance document are:

- the 'giving up density' (GUD) concept
- camera observations of birds and/or mammals
- automatic readers for passive integrated transponder (PIT)

All methods can be used as single methods in tier 3 field studies but may also be combined in study concepts.

Method explanations and discussion



Wood mice feeding on seeds in GUD box

- A method to refine exposure situations under realistic field conditions is the **GUD** concept [3]: Freshly drilled treated seeds may pose a risk to small mammals via oral ingestion. The trade-off between food accessibility and potential predation risk can be investigated with a GUD-experiment. Small mammals search for a fixed number of seeds in boxes filled with sand. The more seeds they remove from the sand after e.g. 24 h, the safer they feel in that habitat. This can be directly compared to the number of seeds removed in adjacent (sheltered) habitats.

Hence, the GUD-approach gives a very good estimate of the perceived risk and thus, the attractiveness of drilled fields as feeding habitats for small mammals.



Motion-triggered trail camera

- **Camera observations** are a very handsome method for a wide variety of field studies:
 - Feeding observations of focal species under realistic field conditions – reflecting all species feeding in the field, determine food items, food preferences or food avoidance.
 - Continuous observations in field effect studies without disturbance – monitoring of reproductive performance or feeding activity and nestling survival in bird nests or nest boxes.

Therefore, camera observations with suitable camera systems (trail cameras or tailor made, e.g. using high resolution surveillance cameras, observation systems) can be a very valuable method on its own or accompanying other methodological approaches in exposure and field effect studies.



Automatic PIT reader in front of rabbit warren

- Effect studies often use the 'capture – mark – recapture' (CMR) concept to determine survival of small mammals and lagomorphs. The typical method to mark animals with PITs (passive integrated transponders) using a hand-held reading device for identifying the PIT number can be expanded by using **automatic PIT readers** [4]. The reading device can be installed at places like rabbit warren entrances, tunnels of mice/voles or nests of birds. Every time an animal equipped with a PIT passes the antenna of the reader, the individual number will be stored by the reading device, giving ideally a large number of readouts (= recaptures) without disturbing the animals.

The use of automatic PIT readers is most suitable for a long-term monitoring after an intense CMR period.

CONCLUSIONS

- Several methods beyond the tool-box provided in EFSA guidance documents are available. Some methods like GUD, cameras and automatic PIT readers, are methods that add very valuable information on various aspects of higher tier studies for birds and mammals, like refined exposure estimates as well as the assessment of PPP-effects on survival or reproduction under field conditions.
- Although not explicitly described in the 'old' and 'new' GD from EFSA on risk assessment for birds and mammals, these methods should be considered as useful tools for the design of higher tier studies for the evaluation and assessment of PPPs under realistic conditions.

References:

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