

Evaluation of endocrine effects in birds: a case for a targeted, life-stage and endpoint specific approach.

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1. Introduction

In the EFSA Scientific Opinion on the Science behind the Guidance Document on risk assessment for birds and mammals [1] has a chapter on risk assessment of substances with endocrine-disrupting properties in birds. It discusses that targeted partial life-cycle or critical life-stage tests, targeting specific endpoints may be developed in addition to the avian two-generation test which is currently being validated. Smaller tests that focus on specific endpoints (e.g. behaviour) may be more sensitive in evaluating the potential endocrine effect of substance than a two-generation test. By evaluating a specific endpoint or portion of the life-cycle it is possible to plan a range of dose concentrations around a specific endpoint and, possibly, use an ECx approach. In addition, in the proposed two-generation reproduction study eggs are incubated artificially, which does not include certain critical endpoints, such as mating (although mounting is looked at), nesting and parental care behaviour. All of these types of endpoints may affect the reproductive success of altricial species especially at concentrations below those found to have an effect in the two-generation test. Individual tests looking at specific endpoints and/or relevant portions of the life-cycle have been performed, but no test protocols have been developed to date. This paper proposes a range of potential test designs that could be followed, depending on the mode of action of the test material and the portion of the life-cycle likely to be the most sensitive.

In addition we will investigate how results from such studies can be incorporated into a model of annual reproductive success. This approach was first proposed by consensus at the 'York workshop' and refined in a subsequent publication by Bennett and Etterson [2].