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## An assessment on the risk of hypodermosis introduction into Switzerland via imported game

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### Abstract

A qualitative risk assessment was undertaken to analyze the likelihood of hypodermosis incursion into Switzerland via imported game from Hungary and the potential impacts on disease control in deer and cattle. The assessment considered the role of disease in the exporting and importing country, trade, possible exposure ways and training of Swiss hunters and deer farmers in disease detection. It was concluded that the risk of hypodermosis incursion into Switzerland can be considered negligible and no impact on disease control is given. The risk of introducing other diseases i.e. tuberculosis via game meat posed the highest risk.

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### 1. Introduction

Bovine hypodermosis is a controlled disease in Switzerland. The disease is considered eradicated since 2002, although single case reports were notified in the years after (FSVO, 2015)<sup>1</sup>. At present all bovine species in endemic areas and on pasture all summer have to undergo mandatory anti-parasitic treatment in autumn. In farmed and wild deer no national control, monitoring or surveillance program exists for deer hypodermosis, but so far no evidence

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for action is given (personal communication M.P. Ryser; Sieber et al.2010<sup>2</sup>). An emergence or re-emergence of hypodermosis would lead to increased costs for disease control and surveillance and possible barriers in trade.

Imported live game and game meat can play a role in transmitting disease (Coburn et al., 2005<sup>3</sup>). On the basis of bilateral agreements, the same veterinary rules apply to the crossing of borders between Switzerland and EU Member States as to “movements within the EU”. The importer carries the risk associated with the import. As long as an official veterinary certificate and TRACES document is given and Council Directive 2002/99/EC<sup>4</sup>, Regulation (EC) No. 853/2004<sup>5</sup> and Regulation (EC) No. 854/2004<sup>6</sup> are fulfilled, no border inspection is mandatory. Whether the import of game plays a role in hypodermosis introduction into Switzerland was aim of the study.

## 2. Materials and methods

The qualitative risk assessment examined the likelihood of introducing hypodermosis via imported game into the Swiss deer and cattle population. The risk analysis was conducted after an imported female deer calf (36kg) from Hungary was slaughtered in the eastern part of Switzerland in canton Glarus in November 2013 and was found positive for hypodermosis. It was hypothesized that in cases of legal import of live game and private or possible illegal import of hunted game from abroad, untreated infested hides, carcasses and game meat might provide a reservoir for warble fly larvae to develop into infectious stages, transmit disease, and thus become endemic. The risk analysis was closely aligned with the OIE Risk Assessment framework, in particular the guidelines for import risk analysis (OIE, 2004)<sup>7</sup>. In addition, the Defra risk estimation on calculating the risk of an exotic disease being introduced in the UK was taken into account (Roberts et al., 2011)<sup>8</sup>. The risk terminology used in the risk assessment is based on the EFSA risk level classification (2006)<sup>9</sup>.

### 2.1. Data

Data were collected for the year 2013 for all Swiss cantons. Data on cattle holdings and on farmed fallow deer holdings are kept in the national registry (AGIS) run by the Food Safety and Veterinary Office (FSVO). Data on hunted roe deer and red deer are collected by the Federal Office for Agriculture and Environment (BAFU). Import notifications on the import of wild game and game meat from Hungary were collected via TRACES (Trade Control and Expert System).

### 2.2. Hazard identification

#### 2.2.1. Hypodermosis and population at risk

The Swiss “population at risk” for hypodermosis is wild and farmed deer, roe deer and cattle. An estimate on the susceptible Swiss deer and cattle population in 2013 is presented in Table 1. In Switzerland the majority of farmed deer is fallow deer, and the minority (<8%) are red deer, sika deer and wapiti<sup>2</sup>. Warble fly is known to be rather host specific<sup>10</sup>. *Hypoderma actaeon* is a parasite of red deer and strictly host specific<sup>11</sup>. *Hypoderma diana* is also adapted to other hosts than roe deer, such as red and fallow deer<sup>12</sup>. Single cases of infestation of non-specific hosts such as horses<sup>13</sup> and people<sup>14</sup> with *Hypoderma diana* larvae were reported in literature. Tarry<sup>15</sup> observed no evidence of cross-infestation between cow and deer warble species.

Table 1. Overview on numbers of cattle, farmed fallow deer and hunted red and roe deer in the 26 cantons of Switzerland in 2013.

Species	Total sum	Min	Q25	Median	Q75	Max
Red deer	10482	0	0.25	48.5	221.75	4485
Roe deer	41973	0	421.25	1128.5	1964.5	6030
Fallow deer	11312	0	51.5	186	593.5	2006
Cattle	1560293	0	14651	36125	83864.25	312798

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