Development of new methods to protect sheep against wolf attacks

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Major problematic behaviour

- Repeatedly attacking the same farm

- Comparison between farmers: with and without wolf attacks

Comparison between farms

Farm characteristics in Slovene wolf habitat related to attacks on sheep

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Comparison study:
2008-2010,
30 attacked vs. 30 non-attacked farms

- Night enclosure was used more by non-attacked farms: effective! But 22% of 288 attacks happened in daytime
- Guarding dogs (2) used by half of the farmers in both categories: no difference; no clear effect
- Electric fences used more by attacked farms. However…..

4-fold increase of annual attacks in spite of use electric fence
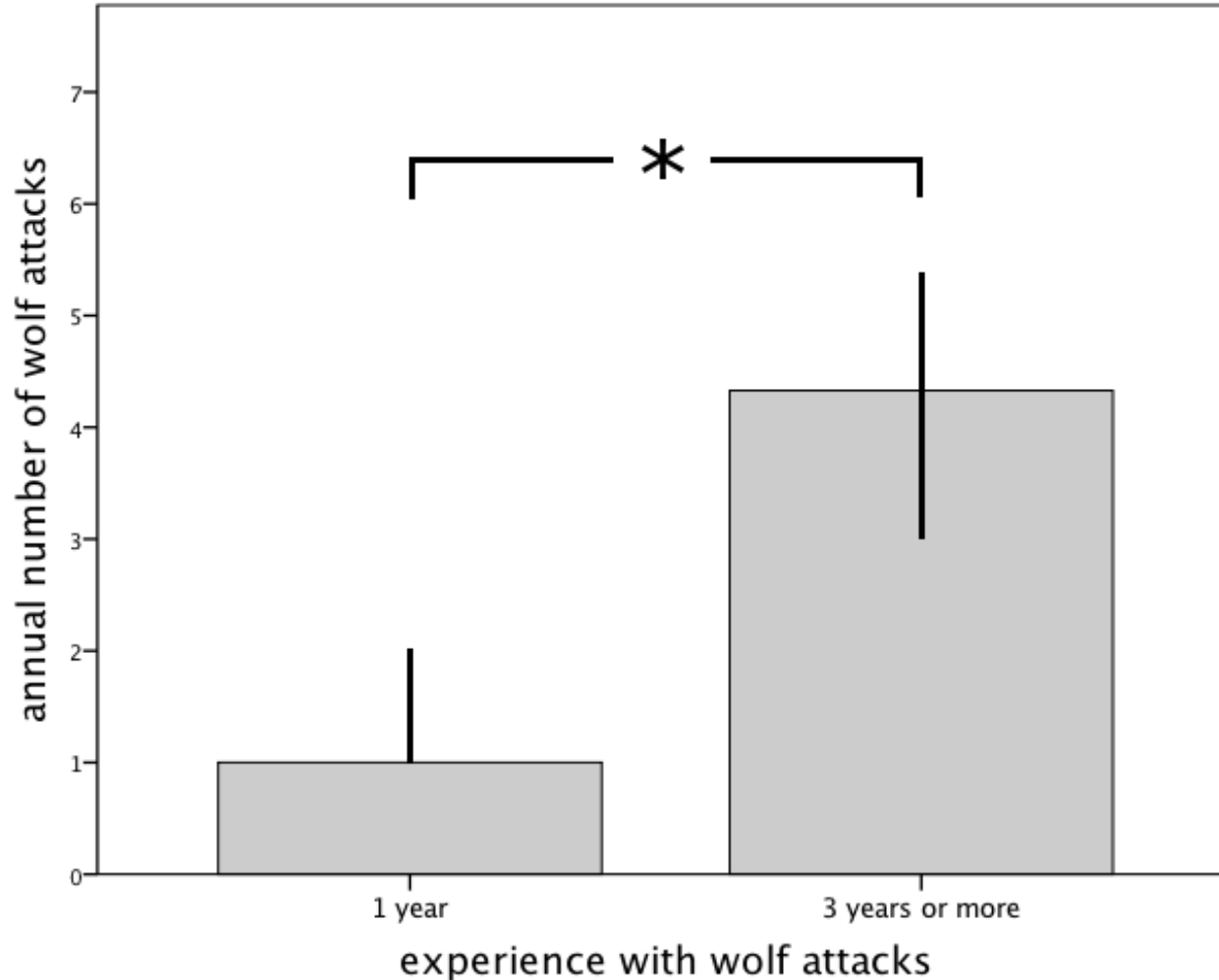
Stepwise approach of solving problem behaviour

- A wolf develops an attack of a sheep on the basis of 3 different experiences:

  1. Approaching a herd
  2. Chasing and biting of a sheep
  3. Consumption of a sheep

- Each experience needs to be taken into account

1. Approach

- Neophobic: avoidance of new context
- No danger: Habituation: reduction of distance (approach)

2. Chasing and biting

- Sheep fleeing from approaching wolf: trigger chasing behaviour
- Chasing has biting as end phase
- Positive reinforcement of chasing and biting as such (dog and a stick)

- A fence prevents effective fleeing and may enhance chasing, thus contributing to surplus killing

3. Consumption

- A dead sheep may trigger consumption
- Ingestion provides reinforcement of selection of sheep as food

Preventing approach:
Inhibition by automated sheep responses

- Automated immediate response of sensors and activated deterrents inducing high level of uncertainty.
- The wolf links his approach to sheep with unpredictable negative events

- To be tested: avoidance of context of aversive stimuli (containing sheep)
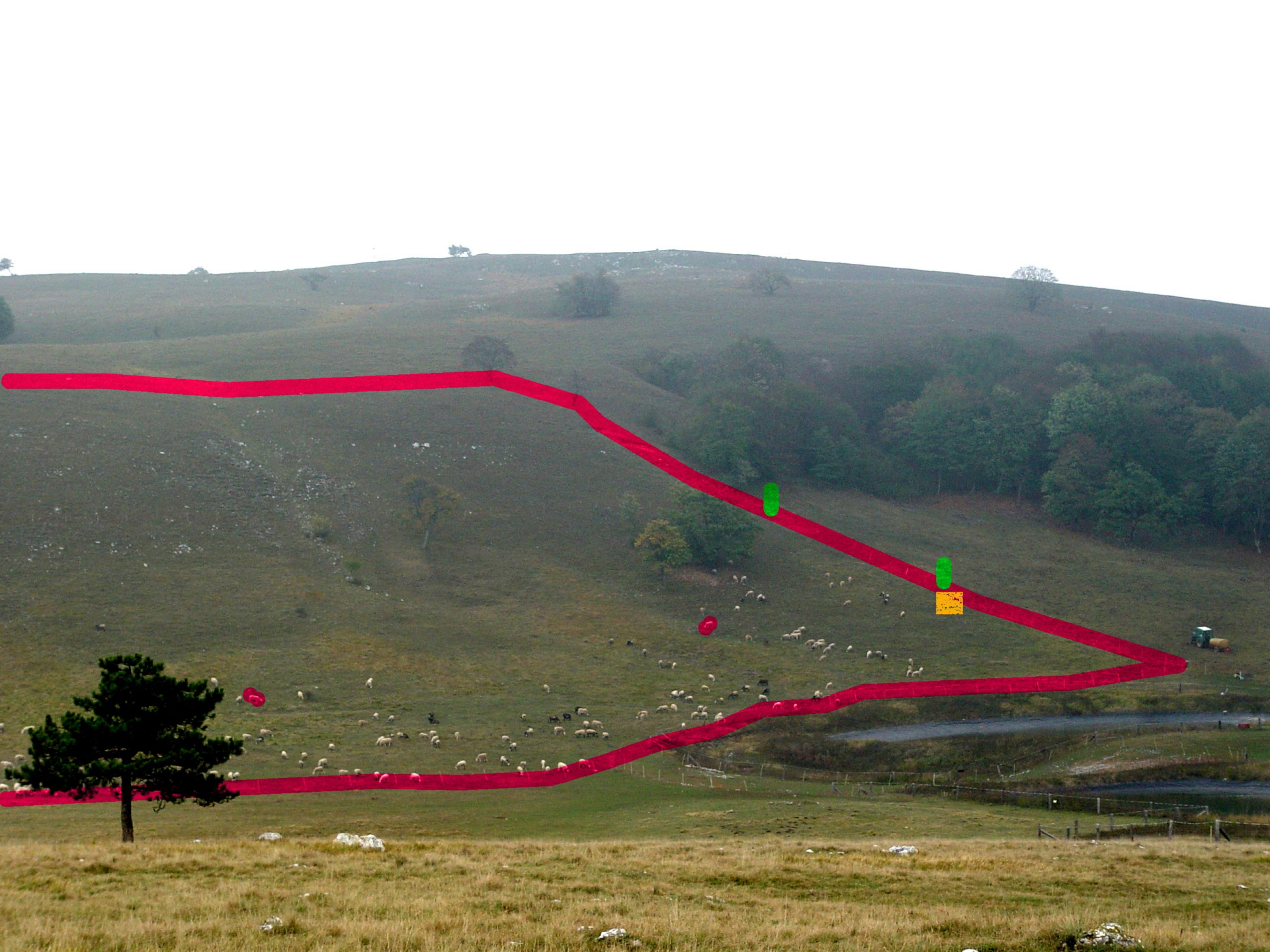
Preventing consumption: classic approach

- Literally becoming sick of it
  - Adding sick making substance to sheep carcass (mixed results with canids)
  - Works in raptors killing free range chickens

- Painful
  - Electric shock when touching a sheep carcass
  - Does not work with raptors

Working hypothesis

- Surplus killing is a result of intrinsically reinforced chasing and biting.

- Repeated attacks at a certain farm are result of compiling, contextual and operant reinforcements in a neophobic animal.

Conclusion

- New prevention methods are needed; aimed at <u>negative</u> reinforcement of:
  - approaching,
  - chasing and biting and
  - consumption.
- Solutions are on the table: package testing!
- Support is welcome for further development and research.