

# Indirect economic impacts for the pig value chain of eradication measures for African swine fever

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## Background

African swine fever is an infectious disease affecting domestic pigs and wild boar with a case fatality rate approaching 100%. Countries and areas affected by ASF in either wild boar or domestic pigs face significant trade restrictions in placing pig meat on the market. Both the infection itself and the control and eradication measures have an important economic impact on the pig value chain. This economic impact can be divided into direct and indirect costs. Definitions of direct and indirect costs vary. However, we consider direct costs as those associated with the effects of the infection and disease itself, such as mortality or reduced fertility. Indirect costs are costs associated with the implementation of control and eradication measures and with restricted market access. Indirect costs for the pig value chain are therefore influenced by the policy and regulatory framework of the country or area where ASF occurs as well as of trading partners.

Although indirect costs of ASF are generally understood to be significant, they are poorly described because they are very complex and robust data are scarce. Often, they are estimated based on expected changes in market prices or lost export potential without taking into consideration the wider pig value chain. This however increases the uncertainty surrounding the economic impact of regulatory measures for decision makers when evaluating various control and eradication options. In addition, a lack of understanding of the indirect economic costs for the larger value chain hinders value chain actors in preparing adequate response mechanisms to cushion the impacts of the control and eradication measures. To fill this gap, we conducted a study on the indirect economic impact of an outbreak of African swine fever on the wider pig value chain in Switzerland.

## Materials and methods

We developed and implemented a methodology with qualitative and quantitative elements for an indirect economic impact assessment across the pig value chain in Switzerland. We first established an overview of all current ASF control and eradication measures as laid down in the current regulatory framework in Switzerland, grouped them into categories and identified which private sector stakeholders of the pig value chain may be affected by each of them. We then conducted semi-structured interviews with various representatives of the pig value chain and asked them to describe the expected economic impact of the measures on their business.

## Results

We identified a total of 104 individual control measures and impacts that would apply in case of an ASF outbreak in Switzerland. These were categorized into 14 different categories. The cumulative highest number of stakeholders were affected by individual control measures and impacts grouped in the categories transport logistics (53 stakeholders), consumer demand (30), pig movement (27), hunting and pork product trade (21 stakeholders each). The highest uncertainty for the impact to be expected was related to the categories for transport logistics, slaughter logistics and the prevention of contact between domestic pig and wild boar. This

uncertainty was mostly caused by ambiguity in the current regulations, in which the detailed implementation modalities were not specifically stated.

Uncertainty for transport logistics was primarily caused by ambiguity about the specific rules to be expected for cleaning and disinfection of animal and feed transport vehicles, both for pigs and other livestock species. Very strict rules for cleaning and disinfection would lead to a significant reduction in overall transport capacities, thereby increasing costs for the industry and causing significant bottlenecks in transportation of animals and feed.

Uncertainty for slaughter logistics was primarily caused by ambiguity about the specific rules to be applied to the slaughter of healthy pigs and subsequent labelling of pig products from ASF outbreak zones. Anticipating unwillingness of wholesalers to purchase pig products with a separate label, there was a high uncertainty among stakeholders about the practical organization of the slaughter of healthy pigs from ASF outbreak zones. This would likely lead to a temporary inability to slaughter finishing pigs in time, thereby increasing costs for pig farmers and causing a blockage for the movement of pigs throughout the entire pig sector.

Uncertainty concerning the prevention of contact between domestic pigs and wild boar was primarily caused by the fact that the existing regulations offer two possibilities, namely fencing or indoor housing. On the one hand, effective wild boar proof fencing is costly, requires time and requires constructional changes on the farm and is therefore difficult to realize in a short period of time. On the other hand, pig farming in Switzerland is characterized by a high proportion of farms providing outdoor access to pigs. Total floor size is calculated assuming access to both indoor and outdoor areas, which implies that longer-term indoor housing while respecting animal welfare requirements is not feasible without reducing the pig population on the farm. A partial or complete depopulation of herds with healthy pigs would cause significant losses for the affected farmers, and depending on the number and type of implicated farms could also cause a significant disruption for the entire pig production in Switzerland.

## **Conclusions**

Our results showed that the indirect economic impacts of an ASF outbreak are expected to be very significant and affect a wide range of stakeholders along the entire value chain. A precise quantification is difficult, because there are ambiguities about the practical implementation of several key control measures, including requirements for transportation in outbreak zones, requirements affecting slaughter and labelling of healthy pigs from outbreak zones and requirements for prevention of contact between domestic pigs and wild boar. Discussions and agreements between the competent authorities and the private industry about the practical implementation arrangements of key measures before the first ASF outbreak occurs can help to reduce uncertainty and will allow all stakeholders to prepare necessary arrangements. This will contribute to reducing the disruptions in the pig value chain and the indirect economic impacts to be expected. The methodology we developed proved to be robust and is transferable to a context of other transboundary animal diseases in disease-free countries.