

## **Research Fellowship**

### **Economic modelling of public health costs related to industrial farming, Global Economic Public Health Research**

#### **Research project**

This research fellowship will support the activities of the “Global Economic Public Health Research” initiative co-ordinated by the non-governmental organization World Animal Protection (WAP) in partnership with the Department of Agricultural and Food Technology of the University of Bologna. Meat and dairy contribute only 18% calories and 38% protein to global nutritional supply yet contribute to a range of externalities including public health impacts and costs. Factory farming involves at least 50 billion terrestrial animals and 51-167 billion fish farmed in aquaculture. While many western nations are near maximal intensification of farming, emerging markets are fast intensifying and consolidating their farming systems. Factory farming contributes to global public health issues such as endemic and pandemic diseases, and antimicrobial resistance (AMR), but the economic burden of the related externalities has been rarely evaluated. In the case of AMR, although the consumption of antibiotics in factory farms is globally much larger than in the treatment of human diseases, the figures of the AMR economic cost caused by industrial livestock production are still unknown. The main objective of this research is to quantify the global burden and the economic cost of factory farming-related AMR, and more specifically to measure:

- a. What is the estimated global factory farming consumption of antibiotics currently in tons and percentage of global consumption?
- b. Estimate the global proportions and volumes used currently for growth promotion and group prophylaxis in factory farming.
- c. Estimate as reliably as possible: the attribution of the above to the global AMR crisis.
- d. Calculate or model the global burden and annual cost (USD translation):
  - Currently (2021 or 2020 figures – or as practical)
  - Projected in 2050 if Business as Usual in factory farming increases for a human population of 10b (modeling).

#### **Plan of activities**

Under the direction and supervision of the fellowship tutor and of the responsible of the research for the University of Bologna and in cooperation with the partner institutions, the holder of the research fellowship will perform the following activities:

Research using available data sources and agreed assumptions as outlined in steps 1-8, culminating in a report showing methodology, findings, analysis, list of tables/figures and conclusions.

- Step 1 – Estimate the global livestock production from selected species
- Step 2 – Estimate their factory farming proportions as compared to independent family

farming

- Step 3 – Estimate the global consumption of antibiotics in tons
  - Step 4 – Attribution of the antibiotic consumption to factory farming as compared to independent family farming
  - Step 5 – Estimate the global proportions and volumes used currently for growth promotion and group prophylaxis in factory farming
  - Step 6 – Estimate the antimicrobial resistance related to factory farming
  - Step 7 – Estimate the burden of AMR related to factory farming
  - Step 8 – Estimate the costs of AMR from factory farming
  - Check-in meetings with the WAP as pre-scheduled following each step.
  - Output – final report containing outlining methodology, findings, analysis, list of tables/figures and conclusions.
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