OBJECTIVES: Campylobacteriosis is one of the most important human foodborne infections, attributed to broiler chicken consumption in about 30% of cases. In a recently published cost-utility model of potential Campylobacter control measures in the EU-27, disease burden and cost of illness estimates were driven by data from the Netherlands. The aim of our work was to gather country-specific cost of illness estimates, to generate a conservative estimate of Campylobacter related disease burden expressed in QALYs, and to reassess the cost-effectiveness of control measure options. METHODS: Data from The Netherlands on productivity loss and direct healthcare costs were corrected for country-specific gross average wages and total health expenditure per capita, respectively. Health burden due to acute gastroenteritis, Guillain-Barré syndrome, and reactive arthritis were estimated from published data. Inflammatory bowel disease and irritable bowel syndrome were omitted, in line with a WHO opinion. RESULTS: Based on the adapted model, the EU-wide implementation of the available and acceptable measures against Campylobacter in indoor broiler chicken would be a dominant strategy as compared to the current practice, yielding 26400 QALY gain and 85 million EUR cost saving each year. The expected cost saving is due to the decrease of productivity loss (69%) and direct healthcare costs (31%). As the investigated strategy will not be reimbursed by healthcare payers, the societal perspective is justified. The poster also presents a strategic pricing exercise on bacteriocin treatment in the UK and in Hungary (an intervention option currently under development). CONCLUSIONS: Implementation of the investigated control strategy would be dominant at the EU-27 level. The cost-effectiveness of add-on strategies in the UK could not be justified at the assumed price level. Application of HTA methodology in food safety and nutritional policies could improve public health, and also the allocative efficiency of public health budgets.

Figure 1. Potential food safety interventions in the food chain of indoor broiler chicken. Currently available food safety technologies with good consumer acceptance are highlighted in blue.

Figure 2. Calculation of QALY loss estimate for human campylobacteriosis

Figure 3. Country-specific cost of illness estimates for human campylobacteriosis

Figure 4. Results of the adapted cost-utility model.

ICER > 3x GDP per capita

ICER = 1-3x GDP per capita

ICER < 1x GDP per capita

Cost saving

50% of EU-27 human cases

ON FARM

slaughter

F4 - Vaccination

F5 - Bacteriocin

Test 1

Yes/no
treatment

evaluation

F2 - 42±0.5d
slaughter

F3 - No

S1 - Standard

preoperative

hygiene

S4 - Hot

water

S5 - UV

illumination

F1 - Enhanced

bacteriocin

T0

Risk

Cooling

2.

Country-specific cost of illness correction factors

The EFSAs Scientific Opinion claimed 2,400 million EUR annual cost for 9 million human campylobacteriosis cases, resulting in a 267 EUR/case estimate. The underlying data from the Netherlands was 177 EUR/case for productivity loss and 62 EUR/case for direct healthcare costs. For country-specific correction factors, annual income per capita (UNICEF) and health expenditure per capita (OECD) were applied (Figure 3). It is apparent that extrapolation of cost of illness data from the Netherlands would lead to an overestimated economic burden estimate in the EU-27.

3. Re-evaluation of the investigated strategy

Results of the adapted cost-utility analysis are summarized in Figure 4. The EU-wide implementation of currently available food safety technologies with good consumer acceptance would be a dominant approach, generating 26,400 QALYs at a cost saving of 85 million EUR in the EU-27 each year.

4. Value-based pricing of bacteriocin treatment

The assumed price of bacteriocin treatment is 60 EUR/year/1000 chicken in the published model. According to our adapted estimates, the value based price of bacteriocin treatment could be 50-65 EUR/year/1000 chicken in the UK, and 393-551 EUR/year/1000 chicken in Hungary in the current situation. However, if bacteriocin treatment is introduced as an add-on to the available interventions with good consumer acceptance, the value-based price of bacteriocin treatment could be 25-31 EUR/year/1000 chicken in the UK and 166-231 EUR/year/1000 chicken in Hungary.

CONCLUSIONS

Implementation of available food safety interventions with good consumer acceptance would be a dominant strategy in the EU-27, as confirmed by our conservative, adapted model results.

Bacteriocin treatment (under development) would not be cost-effective at the assumed price in the UK (as opposed to Hungary) if compared with the combination of available food safety interventions with good consumer acceptance;

Adoption of HTA methodology in the context of food safety and nutrition policies could improve the allocative efficiency of public health oriented budgets.

COMMENTARY

The EU food safety policy aims to ensure that food is safe for human consumption. As a result, the food safety policies put in place have had a significant impact on public health. The implementation of food safety policies has led to a reduction in foodborne illnesses and an improvement in public health. However, despite the efforts made, foodborne illnesses continue to be a major public health concern. This is because foodborne illnesses are caused by a wide range of pathogens, which can be transmitted through contaminated food or water.

The results of this study suggest that the implementation of food safety policies in the EU-27 could lead to a significant increase in public health benefits. This is because the study found that the implementation of food safety policies would result in a reduction in the number of foodborne illnesses, which would in turn lead to a reduction in healthcare costs and productivity losses. Additionally, the study found that the implementation of food safety policies would result in a significant increase in the quality of life for individuals affected by foodborne illnesses.

The results of this study highlight the importance of implementing food safety policies in the EU-27. This is because foodborne illnesses continue to be a significant public health concern and the implementation of food safety policies could lead to a significant increase in public health benefits. However, the implementation of food safety policies will require a significant investment in resources and infrastructure. Therefore, it is important for policymakers to consider the potential benefits of implementing food safety policies when making decisions about the allocation of resources.