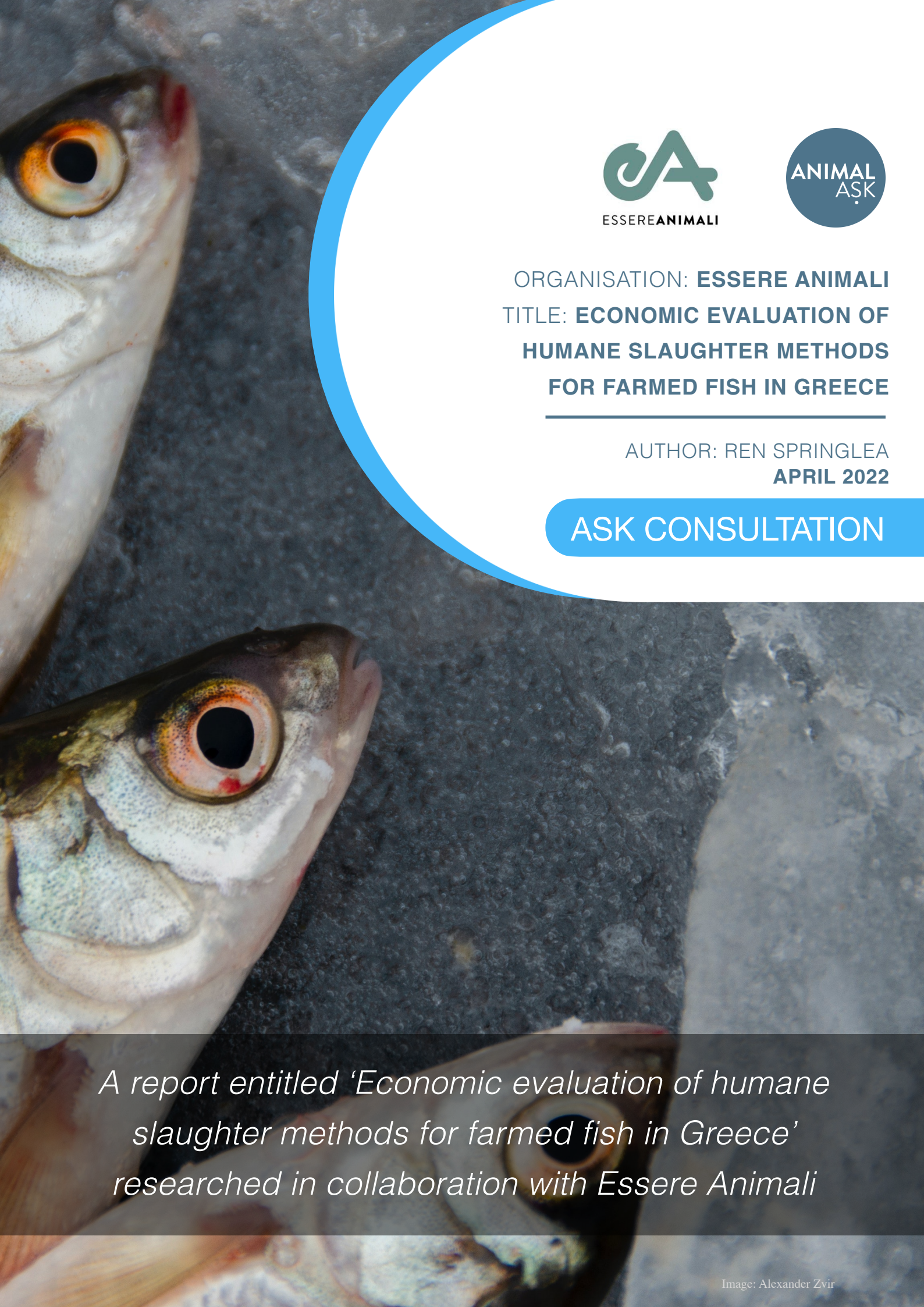

ESSEREANIMALI

ANIMAL ASK

ORGANISATION: **ESSERE ANIMALI**

TITLE: **ECONOMIC EVALUATION OF HUMANE SLAUGHTER METHODS FOR FARMED FISH IN GREECE**

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ASK CONSULTATION

A report entitled 'Economic evaluation of humane slaughter methods for farmed fish in Greece' researched in collaboration with Essere Animali

Image: Alexander Zvir

SUMMARY

This is a supplementary document to the report Economic Evaluation of Humane Slaughter Methods for Farmed Fish in Italy. In this document, we highlight how the results of the economic evaluation change for the context of Greece. We focus on sea bass and sea bream, the two species that dominate finfish farming in Greece. Our economic analysis shows that electrical stunning before slaughter would represent only a small production cost - specifically, 0.9% of the costs for producing sea bass and sea bream. Even if these additional costs were passed along to consumers, we expect that retail price increases would be minimal, when compared to the willingness to pay more for higher welfare standards expressed by the consumers.

AQUACULTURE IN GREECE

In 2019, aquaculture enterprises in Greece produced a total of 41,300 tonnes (t) of sea bass and 55,500t of sea bream [1]. These two species are farmed using inshore floating sea cages [2].

For sea bass and sea bream, there were 347 enterprises in 2018, with an average of eight full-time equivalent employees per enterprise [3]. Most enterprises belong to larger parent companies [2,3]. The industry is continuing this consolidation into larger companies.

Most of the sea bass and sea bream produced in Greece is exported. For the two species combined, Greece exported 88,700 t in 2019 [4]. This represents about 92% of production. The major destination countries are Italy (41% of exports), Spain (21%), and France (11%). Overall, 95% of exports are destined for the EU, and 5% are destined for third countries.

THE NEED FOR HUMANE SLAUGHTER

Currently, all sea bass and sea bream in Greece are subject to inhumane slaughter practices that are very detrimental for fish welfare. Specifically, all sea bass and sea bream in Greece are slaughtered by asphyxiation in ice or ice slurry [5]. Fish exposed to this slaughter method experience intense suffering and show vigorous attempts to escape [6–8]. This suffering occurs over prolonged periods, with studies demonstrating that fish remain conscious for between 5 and 40 minutes [7–9].

The only method that can lead to acceptable welfare outcomes for sea bass and sea bream is electrical stunning [6]. Electrical stunning is in commercial use for sea bass and sea bream in other countries [10].

The Greek aquaculture industry has expressed interest in fish welfare. The Federation of Greek Maricultures participates in programs to research fish welfare and establish guidelines. The 'Fish from Greece' certification scheme, which is widespread, certifies products according to six pillars - one of these pillars is fish welfare (see https://

fishfromgreece.com). There has been initial, experimental interest in electrical stunning before slaughter [5]. However, despite the industry's concern for fish welfare, the industry has not yet adopted a humane slaughter method like electrical stunning [5].

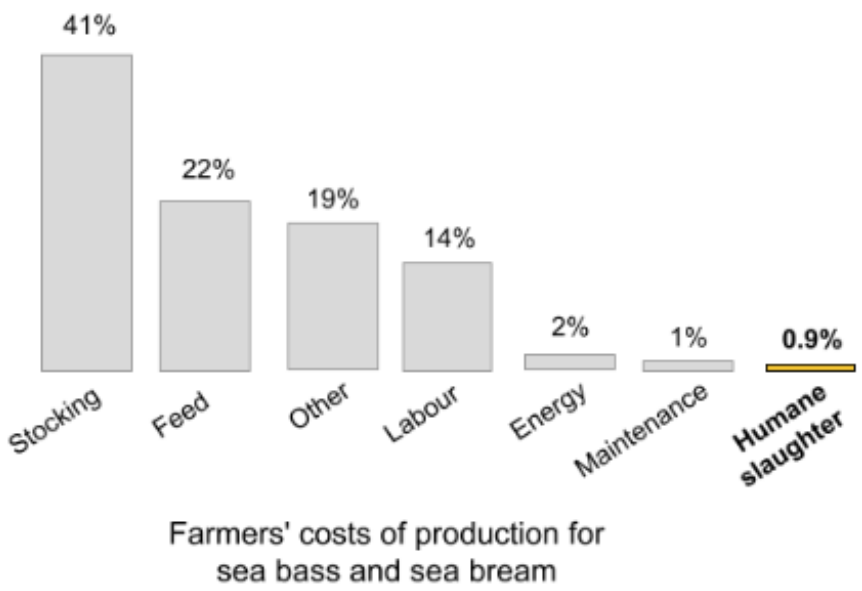
ANALYSIS OF THE COST OF HUMANE SLAUGHTER

Our results show that the cost of implementing humane slaughter for fish is low. Humane slaughter would constitute 0.9% of production costs - the smallest category of costs (Figure 1A). The ex-farm prices would increase from 5.60 €/kg to 5.67 €/kg for sea bass and from 4.70 €/kg to 4.77 €/kg for sea bream. This represents a cost increase of 7 euro cents per kg of fish. (Figure 1B).

Separately, the purchase of humane slaughter equipment would require an up-front investment from farmers. For sea bass and sea bream, this investment would be about 175,000 €. This is well below the annual net profit of an average enterprise, particularly when considering that most enterprises belong to large parent companies.

Our analysis is based on data from official and industry sources [3–5,11]. It is explained in more detail in the full report Economic Evaluation of Humane Slaughter Methods for Farmed Fish in Italy.

(A) Humane slaughter costs for farmers



(B) Humane slaughter leads to a relatively small increase in ex-farm prices

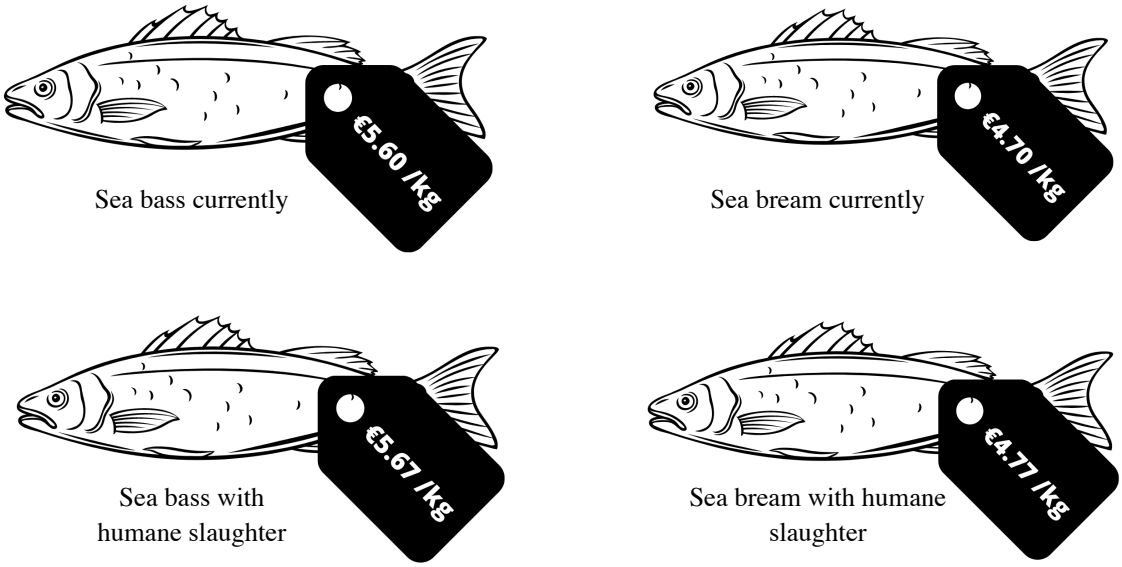


Figure 1: Results of our economic analysis on humane slaughter for aquaculture in Greece. (A) Humane slaughter makes up a small proportion of production costs; (B) humane slaughter causes a minor increase in product price. For panel (B), note that the prices are ex-farm (the prices received by the farmer). Current ex-farm prices are obtained from the European Commission [3].

CONCLUSION

In Greece, producers can improve fish welfare by stunning fish before slaughter. For sea bass and sea bream, the best option is electrical stunning. Our economic analysis shows that stunning before slaughter only represents 0.9% of production costs for sea bass and sea bream. Even if these costs were passed along entirely to consumers, we expect that retail price increases would be minimal.

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