Case study for measuring food loss

Aquaculture and Fisheries sector case study (mussels)

-This case study focuses on measuring food losses occurring during mussel farming in extensive aquaculture in Italy, with the work being conducted by UNIVPM. It aims to follow the one-year productive cycle of Mediterranean mussels (Mytilus galloprovincialis) and monitor production and Food Loss.

Food Loss information	
Commodity	Mussels
Quantification	Weighting
Timing	Primary production: harvesting and post-harvesting losses

General information	
Policies	No policies exist in Italy regarding food loss.
Challenges	One of the greatest challenges has been adapting the framework of food loss definitions to the various scenarios present in the mussel market, as the different production and distribution pathways add complexity to its application.
Technology	Perhaps, the most notable aspect is the use of a scale and software for data management and analysis; however, no additional advanced technology is required
Destination	Mainly left on the field (sea)
Benefits	The main achievement has been the identification of the problem, which in the case of food losses is primarily associated with the cleaning and sorting machinery. Furthermore, it has been observed that the stages preceding the definition of food loss have a considerable impact on the final mussel production.

As the final results from these two completed campaigns and considering the harvest intended for local distribution (Figure 1), the percentage of mussels ready to be sold derived from the cleaning procedure accounted for the 77.17 ± 3.63 % of the total sock' weight. The second most represented fraction was the mussels seed that accounted for 14.85 ± 2.87 % of the total sock' weight. The mussels seed represents an interesting fraction: in fact, although they don't constitute a sellable product, seeds are recovered by the farmer and are used as the starting point for the following productive cycle. The dead mussels under market size (0.85 ± 0.12 %) constituted normal production losses since these were specimens that died for natural reasons (environmental parameters or presence of predators) during the previous months. The real food loss sources were represented by the dead mussel harvested at market

size (2.25 ± 0.53 %) and by mussels irreparably damaged by the cleaning procedure (3.27 ± 0.67 %) which affected the total farm production for 0.36 and 0.68 %, respectively. Differently, slightly damaged mussels, which accounted for 1.62 ± 0.29 % of the total sock' weight, were characterized by minor shell fractures that did not impair the survival from harvesting to the consumer. The discrimination of broken mussels according to the degree of the damage allowed to not overestimate the food loss sources introduced by the automatic cleaning machine. These findings highlighted the major food loss sources that affected the productive cycle analysed within the present case study and could represent a starting point to be compared with other farms and to optimize the supply chain, minimizing losses.

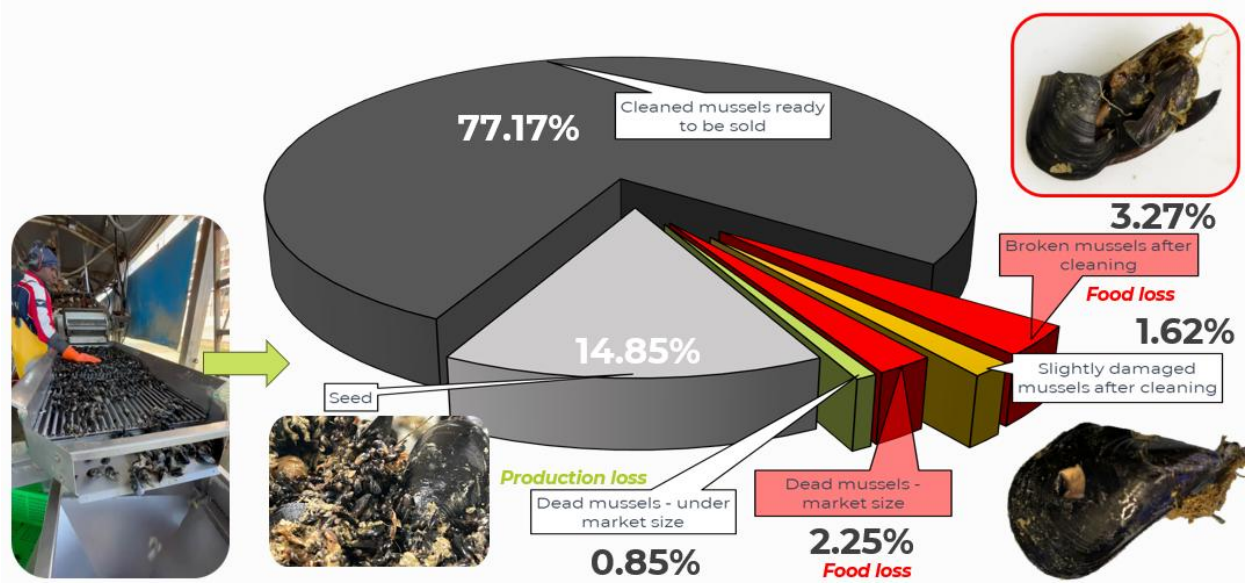

Figure 1. Results obtained from the automatic cleaning procedure conducted on mussels' sock at harvesting for local distribution.