

Analysis of provincial and municipal regulations governing crustacean welfare in Italy

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Abstract

The trade in live crustaceans implies keeping these animals alive after capture and/or farming until purchase by the final consumer. Regarding animal welfare, the European Union includes cephalopods in Directive 2010/63/EU on the protection of animals used for scientific purposes, but there are no further regulations on crustaceans in EU legislation. The present study analysed the provisions of Italian municipal regulations on animal welfare applicable to crustaceans. Only 62 of the 110 municipal websites of the provincial capitals reported a regulation safeguarding animal welfare. These regulations contain different rules on: aquaria characteristics (size, volume and shape); management of aquaria; maintenance (preservation and exposure) of live aquatic species; slaughtering and/or suppression of aquatic species and crustaceans; tying of crustacean claws; and crustacean cooking. The analysis on Italian municipal regulations on crustaceans' animal welfare showed that the provisions are vague, lacking uniformity and scientific guidelines.

Introduction

The trade in live crustaceans implies keeping these animals alive after capture until purchase by the final consumer. Therefore it is essential to be aware of the physiological needs of the marketed species and the best survival conditions. EU regulations include crustaceans among food of animal origin. Live crustaceans are considered primary products because they are the direct outcome of primary production, aquaculture and/or fishing as established by Reg. (EC) 853/2004 (European Commission, 2004). They are also considered fishery products since they belong to *all seawater or freshwater animals (except for live bivalve molluscs, live echinoderms, live tunicates and live*

marine gastropods, and all mammals, reptiles and frogs), whether wild or farmed and including all edible forms, parts and products of such animals. Live crustaceans are also included among the aquatic organisms resulting from any fishing activity or products derived therefrom, as listed in Annex I of Reg. (EU) 1379/2013 (European Commission, 2013). Regulation CE 853/2004 states that fishery products kept alive must be kept at a temperature and in a manner that does not adversely affect food safety or their viability.

Regarding animal welfare, the European Union includes cephalopods in Directive 2010/63/EU on the protection of animals used for scientific purposes (Horvath *et al.*, 2013), but there are no further regulations on crustaceans in EU legislation. Concerning slaughtering, construed as *killing of animals intended for human consumption* reported in Regulation (EC) 1099/2009 (European Commission, 2009), *animals shall be spared any avoidable pain, distress or suffering during killing and related operations.*

To our knowledge, France is the only European country to have filled the legislative gap, promulgating *soft laws* on how to manage live crustaceans before sale and consumption (French Ministry of Agriculture, Agrifood and Forestry, 2012).

In Italy, the media interest focused on the sales conditions of live crustaceans in the retail trade because it is common practice to keep the animals alive, usually on ice, with tied claws and then plunge them alive into boiling water for food preparations. The practice of keeping live crustaceans on ice for retail selling, rather than alive in boxes with their claws tied, and boiling them alive in hot water is not expressly authorized by law and in fact is prohibited by some municipal regulations on animal protection (Santoloci and Campanaro, 2014). Italian municipalities govern matters within their jurisdiction (Legislative Decree 267/2000; Italian Republic, 2000); their regulatory powers are governed by the Constitution (Law 5 June 2003, n. 131; Italian Republic, 2003). The efficacy of municipal regulations is confined to the municipal area (Rescigno, 2003). The aim of the study is to analyse the provisions of Italian municipal regulations on animal welfare applicable to crustaceans.

Materials and Methods

This study is based on municipal regulations *safeguarding animal welfare* in the Italian provincial capitals listed on the Union of Italian Provinces website

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(<http://upinet.it/>). The municipal websites of provincial capitals were consulted to identify regulations on animal protection, if any. Once the provincial capital had been identified its website was consulted searching the link *statuto e regolamenti* (by-laws and regulations) for the regulation in question. If this link was missing, the website search engine was used inserting the keywords: regulation, animal welfare, and protection of animal welfare. Each regulation on protection of animal welfare found was examined for specific rules on aquatic animals and/or crustaceans.

Results

Only 62 of the 110 municipal websites of the provincial capitals reported a regulation safeguarding animal welfare. Of the 62 animal welfare regulations examined, 46 (74.19%) contained rules governing aquatic animals and crustaceans, whereas only 11 provide specific rules on crustaceans for trade. The scope of the regulations mainly applies to *... individuals of all animal species located or living in the municipal area even temporarily.*

In the municipal regulations, the rules governing aquatic animals and crustaceans are reported in chapters reporting different titles: the most frequently titles used are: i) storage of aquatic animal species; ii) size and characteristics of aquaria; iii) prohibitions; iv) fish stock; v) storage of birds and aquatic animals; vi) fish and aquatic animals. Further details are listed in Table 1.

These articles contain different rules on:

aquaria characteristics (size, volume and shape); management of aquaria; maintenance (preservation and exposure) of live aquatic species; slaughtering and/or suppression of aquatic species and crustaceans; tying of crustacean claws and crustacean cooking.

Aquaria characteristics

Thirty-one (67.39%) of the 46 regulations establish that aquaria for aquatic animals must not be spherical or have curved walls; 21 of these 31 regulations prohibit the use of transparent material. Three refer to *small shelters* or *decorations* and/or *decorative rocks* that allow the animals to hide or conceal themselves and thereby reduce the stress caused by the fear of predation. Four (8.69%) regulations specify that the aquarium shape must allow *adequate, free* or *sufficient* movement. Five (10.86%) out of 46 regulations do not specify the size and volume of aquaria, while seven (15.21%) give generic indications that the size should be appropriate to house the size and number of the host species, meet the physiological needs of the species or merely be *sufficient*. The remaining 31 (67.39%) regulations report different formulae to calculate the fish tank volume and hence the amount of water required to ensure the welfare of the host animals. The formula is based on the ratio of water litres x total length (centimetres) of the tank population. Details on methods to calculate aquarium volume are listed in Table 2. Only five of the 46 regulations indicate aquarium length (Naples, Parma, Ancona, Foggia, Palermo) specifying the minimal length must be five times longer (four for Palermo) than the length of the largest specimen. Three regulations also specify the *height* parameter: in one it must not exceed the width of the aquarium increased by 50%, in another the tank must be higher than the minimum length and in the third it must be higher than half the minimum length. The remaining regulations either give no information (30 out of 46) or simply indicate that the height must meet the physiological needs of the host species.

Management of aquaria

All 46 regulations state that water recycling, purification and oxygenation must be guaranteed. Six of the 46 (13.04%) contain no specifications on the physico-chemical characteristics of water, while one regulation simply states that physico-chemical conditions must be ensured. The remaining 39 regulations (87.78%) specify that the physico-chemical characteristics *must be suited to the host species*. One regulation states that the water temperature must be *appropriate*, six further regulations give no indication, while the remaining 39

(84.78%) specify that water temperatures *be suited to the host species*.

Maintenance of live aquatic species

Regarding the feeding of aquatic species, the regulations of Parma, Reggio Emilia, Biella and Foggia require the fish kept in aquaria to be fed according to the host species' peculiarities. Only 11 (23.91%) of the 46 municipal regulations on aquatic animal welfare (Parma, Reggio Emilia, Ferrara, Genoa, Turin, Alessandria, Monza, Rome, Benevento, Foggia, Palermo) specify compliance with specific rules regarding crustacean storage and display for trade, tying up of claws, slaughtering/suppression (killing) and cooking. The municipal regulations of Monza and Foggia must be followed not only by traders and food businesses but are also compulsory for individual citizens.

Tying of crustaceans claws

Five (45.45%) municipal regulations (Ferrara, Rome, Turin, Alessandria and

Benevento) specify rules on tying up crustaceans' claws; all five prohibit the permanent binding. The Ferrara regulation prohibits permanent binding, but allows it during *trade* to avoid fighting and possible injury.

Slaughtering of aquatic species

Regulations on crustacean slaughtering and/or suppression vary in of the different municipalities. Rome, Alessandria, Turin, Monza, Benevento and Palermo prohibit the slaughtering of fishery products in retail trade outlets until delivery to the final consumer. Ferrara regulations specify that crustaceans must be killed before sale to the final consumer and before cooking for food businesses; slaughtering must be performed following the *Opinion of the national reference centre for animal welfare* (2007). Genoa regulations allow crustacean slaughtering *only if the premises have appropriate spaces out of the sight of third parties*.

Table 1. Titles used in municipal regulations regarding safeguard of aquatic animals.

Title	Rate
Storage of aquatic animal species	23
Size and characteristics of aquaria	28
Safeguard and storage of aquatic animal species	1
Prohibitions (further prohibitions)	8
Fish stock	6
Storage in aquaria	1
Marketing of live crustaceans for human consumption	1
Aquatic animals, reptiles and exotic animals	1
Aquatic animals	1
Storage of birds and aquatic animals	6
Storage of birds, aquatic animals and exotic	1
Fish and aquatic animals	3
Freshwater and seawater animals	1

Table 2. Proposed methods to calculate aquarium volume: litres (L) of water for length (cm) of aquatic species.

Rules	Number of regulations
Not < 2 L x cm \sum length	5
Not < 2 L x cm \sum length (at least ≥ 30 L)	17
1 L x cm if the adult fish is <5 cm long	1
2 L x cm if the adult fish >5 cm long	
Not < 1 L x cm length if freshwater fish	1
Not < 5 L x cm length if saltwater fish	
Not < 1 L x cm \sum length	1
Not < 1 L x cm \sum length (at least ≥ 30 L)	1
Not < 2 L x cm \sum length (at least ≥ 35 L)	1
4 L x 10 cm fish length	1
Not < 8 L x cm \sum length	1
At least 30 L	2

Cooking

Four of 11 regulations governing aquatic animals and specifically crustaceans contain rules on cooking live crustaceans. The municipal regulations of Parma, Ferrara, Monza and Foggia prohibit the cooking or boiling of live crustaceans, while Ferrara, Monza and Foggia municipalities extend this rule to private citizens as well as traders and food businesses.

Discussion

The municipalities analysed opted for different legal instruments to regulate animal welfare in the municipal areas with some of them issuing municipal orders instead of a regulation; for Italian law each municipality must publish in its website the regulations; on the contrary publishing municipal orders is not compulsory; as a consequence it is possible that some municipal orders could not be detected by our investigation if not published in the website.

Comparing the Italian municipal regulations on crustaceans' welfare examined in this study with the French soft law, the results show that the provisions are vague, lacking uniformity and scientific guidelines; the main differences detected are that: i) the organization that published the French soft law is *central* (French Ministry of Agriculture, Agrifood and Forestry, 2012) giving uniformity of application at national level; ii) the recipients of the rule are clearly defined (the official control operators); iii) the French authority refers to its research institutes to give specific indications on crustaceans welfare.

Some examples clearly show the limitations of the municipal approach in approaching this matter.

The regulations governing the characteristics of aquaria are generic and often prohibit a spherical shape, but make no specifications as to the materials to be used. The municipal regulations define the size and/or the volume of aquaria according to formulae requiring the total length of host crustaceans without establishing and/or referring to international rules on the measurement of fish in general and crustaceans in particular (Badts and Bertrand, 2012). The biotic load of aquaria is generally defined with reference to the nature of host species and the physico-chemical characteristics of the water.

Among the regulations referring to slaughtering/suppression, only the Ferrara regulation contained specific indications on slaughtering techniques, referring to the document published by the Italian national reference center for animal welfare (Institute for Experimental Veterinary Medicine of Lombardy and Emilia Romagna, 2007). There is a remarkable absence of indications and/or reference to the regulatory requirement to adopt methods that spare the animals avoidable pain, distress or suffering.

The recipients of the rules are not clearly defined: for example, an odd regulation is the requirement to feed the fish kept in aquaria when it is applicable to crustaceans for food consumption: feeding of crustaceans in aquaria is inopportune as it increases metabolic activity, nitrogen excretion, oxygen consumption and bacterial growth. For example, no feeding is required to store lobsters in aquaria as in good conditions they could live for several months without feeding especially if the temperature is kept below 10°C (Beard and McGregor, 2004).

Conclusions

In the absence of clear indications by the central authorities, some municipalities regulated aspects of animal welfare; local administrators are frequently moved by local sensibilities or local trends of opinion. When analysed in the view of protection of crustacean for human consumption, the regulations analysed show the lack of support of scientific agencies in considering the diversity among species.

References

- Badts V, Bertrand J, 2012. Guide de la mensuration des espèces en halieutique. French Research Institute for Exploitation of the Sea, Issy-les-Moulineaux, France.
- Beard TW, McGregor D, 2004. Storage and care of live lobsters. The Centre for Environment, Fisheries & Aquaculture Science, Lowestoft, UK.
- European Commission, 2004. Regulation of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for food of animal origin, 853/2004/EC. In: Official Journal, L 139/55, 30/04/2004.
- European Commission, 2009. Regulation of the Council of 24 September 2009 on the protection of animals at the time of killing, 1099/2009/CE. In: Official Journal, L 303/1, 18.11.2009.
- European Commission, 2013. Regulation of the European Parliament and of the Council of 11 December 2013 on the common organisation of the markets in fishery and aquaculture products, amending Council Regulations (EC) No 1184/2006 and (EC) No 1224/2009 and repealing Council Regulation (EC) No 104/2000, 1379/2013/CE. In: Official Journal, L 354/1, 28.12.2013.
- French Ministry of Agriculture, Agrifood and Forestry, 2012. Service note DGAL/SDSSA/N2012-8219, dated 20th November 2012. Authorisation and health inspection of storage tanks for crustaceans and seawater and freshwater fish. French Ministry of Agriculture, Agrifood and Forestry, Paris, France.
- Horvath K, Angeletti D, Nascetti G, Carere C, 2013. Invertebrate welfare: an overlooked issue. *Ann Ist Super Sanità* 49:9-17.
- Institute for Experimental Veterinary Medicine of Lombardy and Emilia Romagna, 2007. Opinion of the national reference center for animal welfare c/o Experimental Institute for Zooprophyllaxis in Lombardy and Emilia Romagna issued on 29/07/2007. Institute for Experimental Veterinary Medicine of Lombardy and Emilia Romagna, Brescia, Italy.
- Italian Republic, 2000. Italian Legislative Decree no. 267 dated 18th August 2000, Consolidated text of the laws governing local authorities. Italian Republic, Rome, Italy.
- Italian Republic, 2003. Italian Law no. 131 dated 5th June 2003, Provisions to bring Italian legislation into conformity with constitutional law no.3 dated 18th October 2001. Italian Republic, Rome, Italy.
- Rescigno GU, 2003. Corso di diritto pubblico. Zanichelli, Bologna, Italy.
- Santoloci M, Campanaro C, 2014. Tutela giuridica degli animali. Aspetti sostanziali e procedurali. Diritto all'Ambiente Edizioni, Terni, Italy.