

## Surveillance of foodborne disease outbreaks associated with consumption of eggs and egg products: Spain, 2002 - 2003

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Surveillance of foodborne disease outbreaks associated with consumption of eggs and egg products: Spain, 2002 - 2003

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Foodborne disease outbreaks are a public health problem for certain population groups in Spain, because of their magnitude and severity [1]. The foods implicated in these outbreaks tend to be prepared with raw shell eggs, and *Salmonella* serotype Enteritidis tends to be the causative agent. In Spain, foodborne outbreaks due to consumption of eggs and egg products have not declined since 1998 [2], despite the introduction of numerous prevention measures aimed at addressing this problem. Such measures include health education [3] and making it mandatory for food catering facilities that cook and/or serve meals to replace raw shell eggs with pasteurised egg products when food is prepared without heat treatment and for immediate consumption [4].

There are a number of sources that provide information for surveillance of foodborne diseases and outbreaks in Spain. The Outbreak Reporting System (Sistema de Brotes) and the National Reference Laboratory of Spain are the most useful for outbreaks specifically linked to consumption of eggs or egg products. The Outbreak Reporting System collects epidemiological data from the regions of Spain [5]. The National Reference Laboratory shares data with other European countries via networks such as the International Surveillance Network for the Enteric Infections (Enter-net, [http://www.hpa.org.uk/hpa/inter/enter-net\\_menu.htm](http://www.hpa.org.uk/hpa/inter/enter-net_menu.htm)).

For this study, we analysed data on reported foodborne outbreaks in Spain associated with the consumption of eggs and egg products, for the period 2002 - 2003 (the most recent complete years available for both sources).

## Results

### Outbreak Reporting System

In Spain, a median of 951 (range: 882-989) foodborne outbreaks were reported in the 10 years preceding the study. In 2002 and 2003, the equivalent figures were 971 and 1227 outbreaks, respectively.

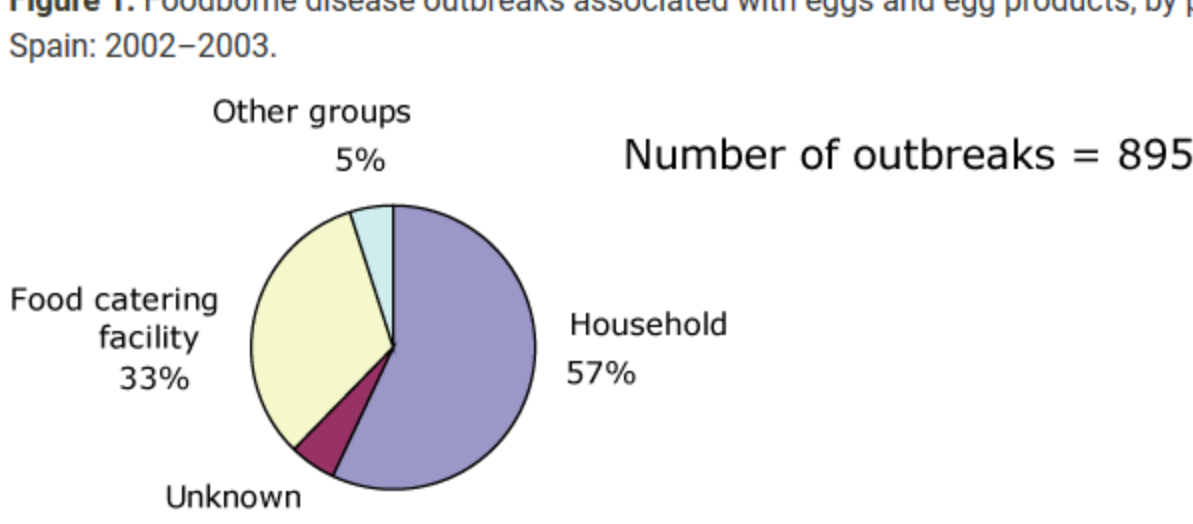
Outbreaks associated with consumption of eggs and egg products accounted for 41% of all foodborne disease outbreaks (895/2198), with a total of 6991 cases including 1059 hospital admissions and 6 deaths (Table 1). Although the number of foodborne disease outbreaks reported in 2003 rose overall, the percentage of these due to consumption of eggs and egg products was not notably different from that registered the previous year (40% in 2003 versus 42% in 2002).

**Table.** Reported foodborne outbreaks and cases associated with consumption of eggs and egg products, Spain: 2002 - 2003

Year	Outbreak Reporting System (a)			National Reference Laboratory (b)				
	No. of outbreaks (c)	No. of cases in outbreaks	No. of community outbreaks	No. of household outbreaks	No. of outbreaks	No. of cases in outbreaks	No. of community outbreaks	No. of household outbreaks
2002	403	3003	145	232	23	80	9	13
2003	492	3988	191	281	14	53	6	7
<b>Total</b>	<b>895</b>	<b>6991</b>	<b>336</b>	<b>513</b>	<b>37</b>	<b>133</b>	<b>15</b>	<b>20</b>

The Outbreak Reporting System data for 2003 indicated an increase over 2002 in terms of both the number of community and household outbreaks, and the number of cases (Table 1). In 2003, 57% of outbreaks were linked to the home, 38% were community outbreaks and, in 5% of outbreaks, the setting was not reported. Among the group of community outbreaks attention should be drawn to the food catering and handling sector, which accounted for 32% and 34% of all outbreaks, with a known setting in 2002 and 2003, respectively (Figure 1). Of the 895 outbreaks linked to consumption of eggs and egg products, 85% (758 outbreaks) were due to salmonella. *Salmonella* Enteritidis, with 438 outbreaks, accounted for 58% of salmonellas in these outbreaks; moreover, it is thought that this percentage would be higher still if the serotype in the 310 outbreaks due to salmonella species were known.

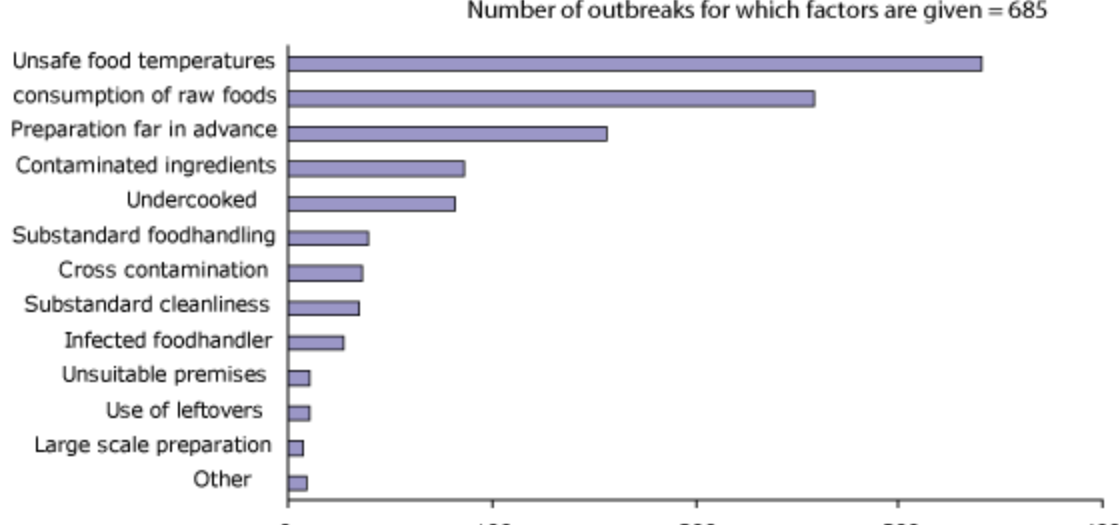
**Figure 1.** Foodborne disease outbreaks associated with eggs and egg products, by place of purchase/consumption, Spain: 2002-2003.



Source: Outbreak Reporting System, National Epidemiological Surveillance System

The foodstuff implicated (eggs and egg products) was laboratory confirmed in 1.7% (15 outbreaks), epidemiologically confirmed in 39% (353 outbreaks), and by both in 8% of instances (74 outbreaks). There was evidence of contributing factors in 685 outbreaks (77%, 685/895), the most important being linked to unsafe temperatures, consumption of raw foods, and preparation far in advance of consumption (see Figure 2).

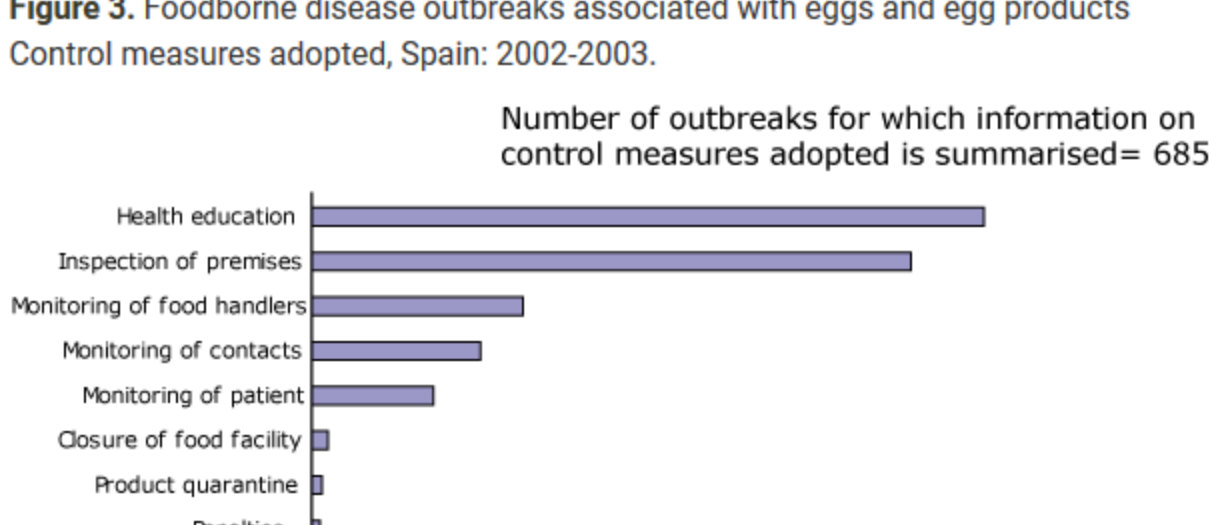
**Figure 2.** Foodborne disease outbreaks associated with eggs and egg products: contributing factors, Spain: 2002-2003.



Source: Outbreak Reporting System, National Epidemiological Surveillance System.

Control measures are reported to have been implemented for 70% of these outbreaks (629/895). Figure 3 shows that the most important control measure was health education, followed by inspection of premises and the monitoring of food handlers. In 11 outbreaks, intervention led to closure of the facility, and in 4 outbreaks, to the imposition of penalties.

**Figure 3.** Foodborne disease outbreaks associated with eggs and egg products: Control measures adopted, Spain: 2002-2003.

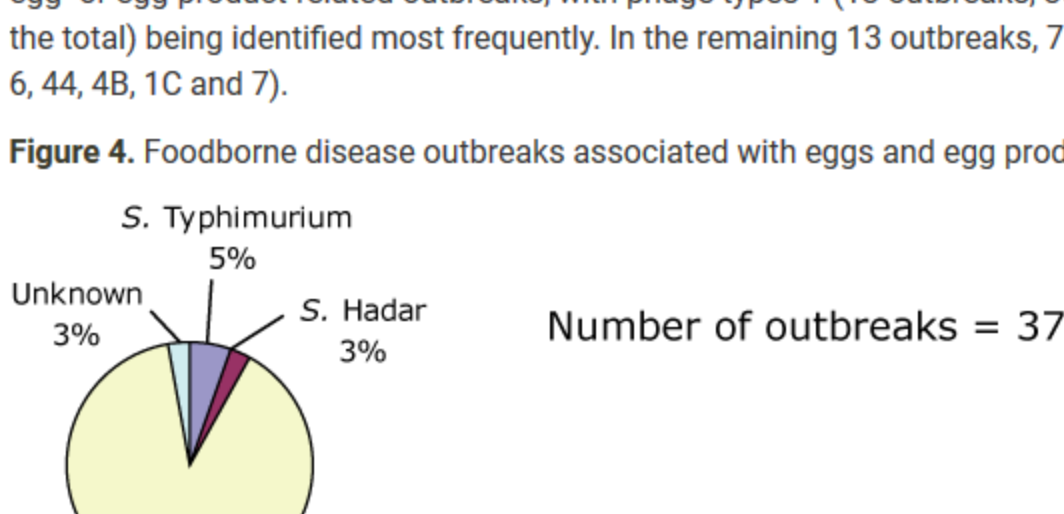


Source: Outbreak Reporting System, National Epidemiological Surveillance System

Over the study period (2002-2003), Spain's National Salmonella and Shigella Reference Laboratory analysed 133 strains corresponding to cases in 37 outbreaks associated with consumption of eggs and egg products (23 outbreaks in 2002 and 14 in 2003).

Unlike the data from the Outbreak Reporting System, the data from the National Reference Laboratory indicated a marked decrease in the number of outbreaks across the two years studied (Table 1). A total of 54% (20/37) of these outbreaks took place in homes. The National Reference Laboratory of Spain obtained data on the suspected food in 34% of the outbreaks studied. The results yielded by this source pointed to eggs as being the suspected food in 12% of all salmonella outbreaks: nevertheless, if all outbreaks in which the suspected food was present were included, this percentage would rise to 62%. The Enteritidis outbreak proved to be the causative agent in 89% (33/37) of outbreaks in which eggs were cited as the suspected food (Figure 4). Information was obtained on *S. Enteritidis* phage types in 32 egg- or egg-product-related outbreaks, with phage types 1 (13 outbreaks, 35% of the total) and 4 (6 outbreaks, 11% of the total) being identified most frequently. In the remaining 13 outbreaks, 7 different phage types were identified (21, 8, 6, 44, 4B, 1C and 7).

**Figure 4.** Foodborne disease outbreaks associated with eggs and egg products, by serotype, Spain, 2002-2003.



Source: National Salmonella and Shigella Reference Laboratory, National Microbiology Centre

## Conclusions

No changes were observed in the pattern of presentation of foodborne disease outbreaks linked to consumption of eggs and egg products in 2002 and 2003 in relation to previous years [2]. Egg- or egg-product-related outbreaks accounted for 41% of all foodborne disease outbreaks reported to the Outbreak Reporting System in the study period. Salmonella was the causative agent in 85% of outbreaks associated with consumption of eggs, with Enteritidis being the most frequent serotype. The household setting is the predominant place of presentation of reported outbreaks in both the Outbreak Reporting System and the National Reference Laboratory. Outbreaks due to eggs and egg products tend to be more frequent in the months with the highest ambient temperatures, with the principal contributing factors being linked to inadequate food storage temperatures.

The rising trend in the number of outbreaks (both community and household) reported to the Outbreak Reporting System from 1999 to 2003 leads us to believe that, notwithstanding the improvements in the surveillance system in some of the country's Autonomous Regions, no changes have been achieved in the population's habits with regard to basic egg-related salmonellosis prevention measures and, more seriously, that there is continuing non-compliance with the regulations designed to ensure prevention in the food catering sector. With the aim of reducing the incidence of these types of outbreaks, in 2003, the Ministry of Health & Consumer Affairs and the Ministry of Agriculture implemented a salmonella control programme in eggs and egg products [7] which lays down action proposals throughout the food chain.

In contrast to the Outbreak Reporting System, the results obtained by the National Reference Laboratory show a decrease in outbreaks across the study period of over 50% compared to previous years [2] and this substantial decline is again in evidence when the two study years are compared. This could be due to data processing changes implemented since 2002 and could reflect worse compliance in terms of the variables for 'linked to outbreak' and 'food'. Another explanation could be that data from only a small proportion of outbreaks in Spain are collected by the National Reference Laboratory, and a relatively small change in the numbers may result in a large percentage change.

There are currently plans to integrate the data from the National Reference Laboratory and the Outbreak Reporting System, in order to improve knowledge of the risks associated with the appearance of new specific salmonella serotypes.

This article was translated and adapted by the authors from reference 1

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