INCIDENCE OF SALMONELLOSIS IN HENS' EGGS

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Introduction

Local prevalence of food poisoning is highest with Salmonella (61.2% of reported food poisoning cases, HSIU, 1989). 547 cases of salmonellosis were confirmed between the years 1986 and 1989. The local health services information unit estimates that only 10 to 15% of the actual number of food poisoning cases are reported to the health authorities. The number of cases of salmonellosis for the year 1990 and 1991, although not yet officially confirmed, shows an increased incidence over the past 4 years.

Evidence in many countries indicated that eggs or egg products are involved in outbreaks of Salmonella (Rodrigue, 1990). This statement prompted this study to investigate the incidence of salmonellosis in local hens' eggs.

Methodology

A total of 900 hens' eggs were examined. These came from the following sources: 800 eggs were collected randomly from farms around the island during the months of July to October. Another 100 were collected when three outbreaks of Salmonella occurred during the same time period in which eggs were suspected to be involved. From the 900 eggs collected 26 were cracked, all the others were whole eggs.

Method

Isolation of Salmonella

The eggs' outer shells were analysed individually. For analysis of the inner egg, the contents of two eggs were mixed together and then examined.

Analysis of Shell

A sterile swab dipped in buffered peptone solution (Oxoid CM509) was rubbed gently onto the surface of the egg shell. Precautions were taken to prevent contamination during handling. The swab was returned to the buffered peptone solution in a glass bottle of 10mls, the protruding part of the swab stick was cut out and the bottle closed, i.e. the cotton bud was left in the bottle. This procedure was done individually for all eggs. The buffered peptone in this procedure was used to detect Salmonella on the

surface of the egg (sample A). The buffered peptone solutions were incubated for 24 hours at 37°C. After that 1ml from each bottle was inoculated in 10ml selenite broth (Difco 0275) and reincubated for 18 hours at 37°C.

Analysis of egg content

The eggs were then deposited in a container with 95% ethyl alcohol for two minutes to disinfect the surface. The shell was cracked aseptically, using a spatula which was previously flamed. The contents of the eggs (in pools of two) were placed in a sterile stomacker bag and the shells were discarded. The egg content was diluted (ratio 1:3) in buffered peptone water and homogenised for one minute in a stomacker 400 (Colworth, Seward Medical, London). The emulsions obtained were each cultured directly onto XLD medium and incubated for 24 hours at 37°C.

Typical colonies were further examined by conventional tests (Ewing, 1986).

Results

Table 1: Salmonella incidence in eggs involved in Salmonella outbreaks

Outbreak	Number & Type	Positive	Localisation
1	32/whole	-	-
2	20/whole	-	-
3	48/whole	-	-

Table 2: Salmonella incidence in eggs not known to be involved in outbreaks

Sample/Origin	Number of eggs	No of positives
Cracked eggs/farms	26	-
Whole eggs/farms	774	-

No eggs were found to be infected with Salmonella.

Discussion

All eggs examined in this study were found to be Salmonella free. This does not imply that the poultry in the Maltese Islands is not infected by Salmonella. In fact, the incidence of salmonellosis is 1% if tested from an infected flock (Maurer, 1989). The fact remains that in order to establish the incidence of salmonellosis in eggs it is necessary to take a large sample size and even a longer period of time.

In Europe and the U.K. Salmonella has been isolated from the contents of eggs implicated in several human outbreaks of salmonellosis (Maurer, 1989). The study of experimentally infected hens with Salmonella conducted under careful controlled conditions indicated that infected hens can indeed produce eggs with contaminated contents at a high frequency, but only during a brief period following exposure (Richard, Cast, 1990).

In a small island it is very difficult to keep chicken flocks isolated to reduce the risk of infection. The risk of infection is great and microbiological control on imported feeds and flocks should be sustained regularly to keep the situation under control. If Salmonella in poultry and eggs is to be kept under control and possibly reduced, few basic measures should be undertaken: (1) Keeping up to date statistical data, e.g. the number of poultry farms, production of eggs, imports of feeds, sale of chickens etc.; (2) Adequate laboratory facilities to monitor eggs, meat, faeces, caecal swabs and feed; (3) An effective and a reliable system for the collection of eggs around the island during the whole year.

An epidemiological investigation is therefore required as well as laboratory based surveillance.

Conclusion

It is recommended that this project is taken as a model and practised throughout a number of years so that a large sample size required is achieved and hence a proper estimation of the incidence of salmonellosis in hens' eggs in the Maltese Islands be established.

References

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