Universitat Autònoma de Barcelona

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# THE EFFECT OF THE CHANGE ON FOOD PROCESSING ON THE GEOGRAPHICAL DISTRIBUTION OF BSE IN GALICIA (SPAIN)

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## Introduction

In Spain the first BSE case was detected in December 2000 in a cow born in Galicia region (Northwest of Spain). Since then, and until October 2005, 590 cases have been detected, 223 of them in Galicia. In 1994 meat and bone meal was banned in ruminant feeding. In 2001 this ban was applied in all domestic species. However, the rendering system was not effective for inactivation of the BSE agent until mid 1998, when implementation of the July 1996 EU-Decision, mandating an overall change in the rendering system to 133°C, 3 bar and 20 minutes, was completely ensured. In this poster we present the spatial distribution of BSE cases of animals born from 1994 to July 1998 and after.

## Material and Methods

Data: Epidemiological data from BSE cases were obtained from Galicia autonomous government. The cases were located to the centroid of the parish, the smallest administrative unit, where the animal was born. Data of the population at risk (cattle over 15 months), pig and poultry population was obtained at parish level from 1999 agricultural census published by Galicia autonomous government.

Disease mapping: The aggregation level used in the analysis was the parish (i =1,..., 314). For each parish we estimated the risk (r[i]) of being infected by the BSE agent as the ratio.

r[i] = O [i] / E [i]

Being O[i] and E[i] the observed and expected BSE cases respectively in each parish. To avoid overdispersion of r[i] and to take into account the lack of independence between close areas, hierarchical Bayesian models were built using Win Bugs software version 1.4.1 (http://www.mrc-bsu.cam.ac.uk/bugs). Pig and poultry population were linearly added to the bayesian model in order to test their influence on r[i].

Cluster analysis: To explore if the areas of higher risk were concentrated geographically we used SatScan® (http://www.satscan.org) described by Kulldorf (1997). We assumed that under the null hypothesis the number of cases followed a Poisson distribution and we run a purely spatial analysis for both periods.

## Results and discusion

Two hundred twenty-three BSE cases have been detected in Galicia until October 2005, 164 of them were born between 1994 - mid 1998 and 49 after mid 1998 (figure 1).
The results of the hierarchical bayesian model evidenced that the risk of infection over Galicia was not homogeneous in both periods. The distribution of the BSE risk was different between them. In the first period, the parishes with higher risk were located mainly in the central and south east area (figure 2) while in the second period they were located mainly in the northwest (figure 3).

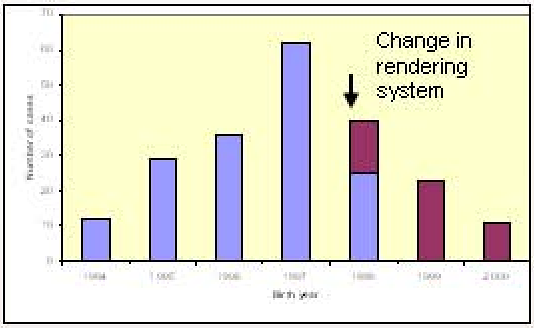


Fig. 1

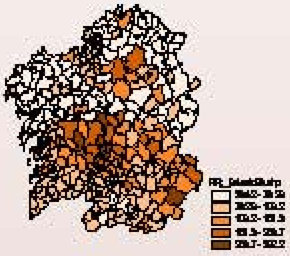

Fig. 2

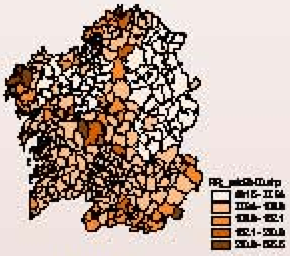

Fig. 3

In Great Britain, Stevenson et al. (2005), found that for the cohort of animals born after the ban on MBM feeding, area-level BSE risk was additionally associated with greater number of pigs relative to cattle. In France Abrial et al. (2005) found an increase in the risk of 2.4% per 10000 pigs.
The cluster analysis evidenced a significant cluster in the central part of Galicia in the first period; p-value of 0.001, with 63 observed cases for 25 expected. In the second period, after mid 1998, no significant cluster was detected.
The number of cases drops after the effective implementation of the July 1996 EU-Decision (figure 1), and the spatial pattern of the disease between the two periods is different.
The change in the spatial pattern seems indicate that the factors involved in the maintenance of the cluster in the central part of Galicia were not present in the second period. This can indicate the reduction of cross contamination after July 1998, when the change in the rendering process was effectively implemented.

**Referencias**

1. Abrial *et al.* 2005. Vet Res. 36: 615-628
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3. Stevenson *et al.* 2005. Prev. Vet. Med. 69: 129-144