

### BLUE TONGUE CONTROL USING VACCINES: EMILIA ROMAGNA EXPERIENCE.

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#### Summary

Emilia Romagna Region was involved in the national vaccination against bluetongue program in 2003: some Municipalities of three Provinces (Parma, Reggio Emilia and Modena) bordering with the Tuscany Region have been included in the vaccination program, using the monovalent type 2 vaccine. The purpose of the study was to evaluate the organisation of a vaccination program settled by the Regional Veterinary Service and the relative cost of the vaccination, considering the large number of animals involved. To better evaluate the real cost of a vaccination campaign, costs sustained by the Reggio Emilia Local Sanitary Unit (RELSU) were specifically analysed. Blue Tongue (BT) vaccination of all domestic ruminant is a very expensive operation (9.20 Euro/ vaccinated animal). Therefore to value the need of a new vaccination campaign in a specific area other than the presence of a high risk of infection introduction the cost of the operation should be considered.

**Keywords:** Blue Tongue, Vaccination, Emilia Romagna, Cost.

#### Introduction

A national vaccination program aimed at promoting immunisation against Blue Tongue started in 2001 in Italy, involving many Regions of the Country. To date the third annual vaccination has been completed.

Aims of the vaccination program were to protect sheep and goats from the clinical illness and to create an immune covering on all the sensitive population (domestic ruminants), able to stop the viral circulation. The vaccination of at least the 80% of the sensitive population has been considered as necessary.

Emilia Romagna Region was involved in the national vaccination program in 2003: 30 Municipalities of three Provinces (Parma, Reggio Emilia and Modena) bordering with the Tuscany Region have been included in the vaccination program, using the monovalent type 2 vaccine. Such prophylactic measure aims to create a barrier to the possible passage of the BT virus in the North of the Country, still free from the infection. In table 1 the results of the regional vaccination campaign are reported: at the end of the period (1<sup>st</sup> January - 30<sup>th</sup> April 2003) more than 95% of sensitive animals (about 40,000 cattle and 8,000 sheep and goats) have been vaccinated. So, the involved Local Health Units have had to concentrate most of their available resources in such activity.

The purpose of the study is to evaluate the organisation of the vaccination program settled by the Regional Veterinary Service and the relative cost of the vaccination, considering the large number of animals involved.

To better evaluate the real cost of a vaccination campaign, costs sustained by the Reggio Emilia Local Sanitary Unit (RELSU) are specifically analysed.

#### Results

##### Territory

In Figure 1 is represented the territory of Emilia Romagna Region and, in particular, the eight Municipalities of Reggio Emilia Province subjected to mandatory vaccination. The territory involved is mountainous and shows a low animal density (0.8 farms/km<sup>2</sup>; 31.3 animals/km<sup>2</sup>).

In table 2 the results of the vaccination campaign in the eight Municipalities are reported. At the end of the campaign in all of them the percentage of vaccinated animals on the total sensitive animals has been more than 80% (minimum level). In seven of them was more than 90%.

##### Vaccination Costs

The costs of the vaccination campaign have been analysed considering human resources (veterinarians, accountants, etc.), transfer costs (kilometres), disposable material and vaccine, as follows.

##### Human resources

The area of this study is under the control of the Area Sud District, one of the three districts that form the RELSU. The RELSU decided to use its available resources, organising the veterinary staff of the entire province without the employment of practitioners.

28 veterinarians (12 from Area Sud District and 16 from the other districts of the RELSU), have been employed. They totally worked about 300 hours in organising the operation (farmer contacts, recording and reporting) and 2,377 hours on field. The agreement between farmers and veterinarians was fundamental to obtain the necessary co-operation, as during the vaccination campaign, media contribute to the increase of fear of vaccination in farmers. In fact, the diffusion of uncontrolled news about unwelcome effects on the reproductive apparatus in cattle and sheep represented a serious problem and lot of time was spent to convince farmers of the need of vaccination.

Considering about 60.35 Euro/hour the veterinary cost per hour, RELSU has been sustained a cost of about 161,556 Euro. One accountant has been employed for administration and other activities, working about 80 hours. Valuing about 25.00 euro per hour, 2,000 euro have been spent, and cost for personnel reached the sum of 163,556 euro.

#### Transfer costs

Most of the farms were small (less than 50 animals) scattered in mountainous territory; veterinarians have had to cover about 21,300 km to reach all the farms. The relevant cost has been evaluated in about 4,515 euro.

#### Disposable material and vaccine

Multi-dose syringes (1,500 euro), needles (one for each animal vaccinated, 1,000 euro), tattooing forceps, disposable boots, gloves and overalls (about 2,500 euro) have been bought: total amount for purchased stuff was about 5,000 euro.

Vaccine was supplied by the Reggio Emilia diagnostic laboratory of Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, which has been provided by the National Reference Centre for Exotic Diseases (CESME), Teramo. Considering the EU Decision 2002/545/CE that supplied a financial contribute of 700,000 Euro to Italy for the purchase of 6,500,000 doses of vaccine, we estimated a cost of 0.11 euro/dose.

The vaccination in the Province of Reggio Emilia (1,9054 animals) required about 1,9500 doses (195 bottles 100 ml) of BT vaccine type 2; planning the vaccination of farms allowed the use of the entire bottle of vaccine within the expiration date, avoiding waste of doses.

At the end of operations, more than 95% of sensitive animals present in the area had been vaccinated, as reported in Table 2. Few cases of abortion in cattle or sheep were signalled and reported in Table 3, but the Blue Tongue virus has never been isolated from the foetus or placenta.

Table 4 resumes the costs sustained by RELSU: the vaccination campaign in the only Province of Reggio Emilia cost about 9.20 Euro/ vaccinated animal.

## Conclusions

BT vaccination of all domestic ruminant is very expensive; informing and convincing farmers about the necessity of vaccination require a lot of time. Nevertheless, the vaccination program has been completed without asking for funding and with farmer's co-operation. However, it is important to notice that each case of abortions, stillborn calves, neonatal mortality and weak and slow-starting new-born has been attributed to Blue Tongue vaccination by farmers.

At the end of the risk period (August - November), it could be opportune to find the most cost effective outcomes, through the valuation of the diffusion of BT infection in the whole Italian territory, limiting the next vaccination campaign to the Regions with a high risk of infection.

## Tables

Table 1: Animals present and vaccinated at the end of the vaccination campaign, 30<sup>th</sup> April 2003.

Species	Province	Farms	Animals	Vaccinated animals	% Vaccinated animals / present animals
CATTLE	MODENA	379	9383	8991	95.8%
SHEEP & GOATS	MODENA	44	1455	1412	97.0%
CATTLE	REGGIO EMILIA	455	16812	16170	96.2%
SHEEP & GOATS	REGGIO EMILIA	63	3358	2884	85.9%
CATTLE	PARMA	589	14471	13982	96.6%
SHEEP & GOATS	PARMA	98	2949	2620	88.8%
<b>Total</b>	<b>CATTLE</b>	<b>1423</b>	<b>40666</b>	<b>39143</b>	<b>96.3%</b>
<b>Total</b>	<b>SHEEP &amp; GOATS</b>	<b>205</b>	<b>7762</b>	<b>6916</b>	<b>89.1%</b>
<b>Total Emilia Romagna Region</b>		<b>1628</b>	<b>48428</b>	<b>46059</b>	<b>95.1%</b>

Table 2: Province of Reggio Emilia - Municipality involved in vaccination campaign and percentage of vaccination (ruminant farms and animals) achieved at the end of operation, 30<sup>th</sup> April 2003.

Municipality	% vaccinated farms	% vaccinated cattle	% vaccinated sheep and goats	% vaccinated ruminants
BUSANA	100.0%	91.5%	67.2%	83.2%
CASTELNOVO NE' MONTI	100.0%	96.0%	89.8%	95.5%
COLLAGNA	100.0%	96.0%	89.6%	92.0%
LIGONCHIO	100.0%	96.2%	71.4%	93.9%
RAMISETO	100.0%	98.3%	82.7%	91.5%
TOANO	100.0%	98.5%	82.7%	98.2%
VETTO	98.5%	97.1%	89.4%	95.9%
VILLA MINOZZO	100.0%	95.2%	86.2%	92.4%
<b>Total</b>	<b>99.8%</b>	<b>96.9%</b>	<b>85.9%</b>	<b>95.0%</b>

Table 3: abortions recorded in vaccinated animals in the Province of Reggio Emilia.

Species	Event	Days after vaccination	Virological test (PCR)
Bovine	Abortion at 12 <sup>th</sup> week of pregnancy	9	negative
Bovine	Abortion at 29 <sup>th</sup> week of pregnancy	10	negative
Bovine	2 dead born calves	3	negative
Bovine	Abortion at 21 <sup>st</sup> week of pregnancy	18	negative
Bovine	Aborto alla 20 <sup>th</sup> week of pregnancy	2	negative
Bovine	Abortion at 25 <sup>th</sup> week of pregnancy	19	negative
Bovine	Abortion	1	negative
Bovine	Abortion	1	negative
Bovine	Abortion	1	negative
Bovine	Abortion at 24 <sup>th</sup> week of pregnancy	15	negative

Table 4: costs sustained by RELSU.

Description	No.	Total hours	Unitary cost	Total Euro
Veterinarians	28	2.677	60,35	161.556,95
Accountant	1	80	25,00	2.000,00
Transfer	21300 Km		0,21	4.515,00
Disposable material (syringes, needles, etc.)				5.000,00
Vaccine	19500 doses		0,11	2.145,00
<b>Total</b>				<b>175.216,95</b>
<b>Cost for vaccinated animal (19.054 animals)</b>				<b>9,20</b>

## Figures

Figure 1: Emilia Romagna Councils (yellow) subject to mandatory vaccination.

