Report on

the Assessment of

the Geographical BSE-Risk

(GBR) of

BRAZIL

NOTE TO THE READER

Independent experts have produced this report, applying an innovative methodology by a complex process to data that were voluntarily supplied by the responsible country authorities. Both, the methodology and the process are described in detail in the final opinion of the SSC on "the Geographical Risk of Bovine Spongiform Encephalopathy (GBR)", 6 July 2000. This opinion is available at the following Internet address:

<http://europa.eu.int/comm/food/fs/sc/ssc/outcome_en.html>

In order to understand the rationale of the report leading to its conclusions and the terminology used in the report, it is highly advisable to have read the opinion before reading the report. The opinion also provides an overview of the assessments for other countries.

FULL REPORT

1. Data

- The available information was sufficient to carry out the GBR risk assessment.

Sources of data

Country dossier (CD) consisting of:

- Information on animal transmissible spongiform encephalopathies to serve as a basis for request of acknowledgement by the European Union of the sanitary situation of the Brazilian flock. Ministry of Agriculture and Supply, Cattle raising Defence Secretariat, Animal Defence Department, Monitoring and Sanitary Programs Co-ordination. Brasilia, January 2000.
- Clarifications and comments to the Draft report on the assessment of the BSE risk of Brazil (5/12/2000, 08/01/2001).
- Clarifications and comments to the Draft Final report on the assessment of the BSE risk of Brazil (6/02/2001, 26/02/2001, 2/03/2001).
- Additional detailed data on the slaughtered animals and on animal traceability (received 22/03/01).

Other sources:

- EUROSTAT data on exports of "live bovine animals" and of "flour, meal and pellets of meat or offal, unfit for human consumption; greaves", from the EU Member States covering the period 1988 to 1999.
- NIMEXE dataset from 1976-1987on exports from Member States to Brazil.
- UK-export data on "live bovine animals", 1980-1996, and on "Mammalian Flours, Meals and Pellets",1980-2000. As it was illegal to export mammalian meat meal, bone meal and MBM from UK since 27/03/1996, exports indicated after that date may have included non-mammalian MBM.

2. EXTERNAL CHALLENGES

2.1 Import of cattle from BSE affected countries

The import data provided by the country are largely compatible with the export data provided in Eurostat and by the UK. These data show that Brazil had significant imports of live cattle from UK (258) and other BSE affected countries (5,961; see table 1). These imports are sufficient to imply that, if all these imported cattle had entered the Brazilian rendering system, the risk that the BSE-agent has been introduced into the country's feed cycle would be high.

However, this risk is strongly influenced by the fate of the cattle after import and the Brazilian Authorities provided detailed information on this, as described. In essence this information shows that only a part of the imported cattle (436 out of 6,219) was finally slaughtered and rendered.

Import of live cattle (n/year) into BRAZIL from BSE-affected countries																		
Period	**UK**			**CH**	**FR**		**BE/Lux**		**NL**		**DK**		**DE**		**IT**		**Non-UK**	
Source:	**CD**	**EU**	**UK**	**CD**	**CD**	**EU**	**CD**	**EU**	**CD**	**EU**	**CD**	**EU**	**CD**	**EU**	**CD**	**EU**	**CD**	**EU**
1980				18	85	14							14		102			
1981				8														
1982				2	9	199												
1983					25	75							4					
1984					5	4												
1985				1	5	55												
1986					13	4												
1987					1	10												
80-87:	**79**			**29**	**143**	**361**							**18**		**102**		**292**	**361**
1988																		
1989	119	119	119	8									1		8	8		
1990	60	60	60		10	65				5			9	12	27	26		
1991					14								334	280	9	9		
1992					1								93	132				
1993					188	256							924	1086				
88-93:	**179**	**179**	**179**	**8**	**213**	**321**				**5**			**1,361**	**1,510**	**44**	**43**	**1,626**	**1879**
1994				34	486	417	12	14			36	116	2,031	2,130				
1995				7	237	143					15		968	760				
1996				5	29	16			8				3		23	36		
1997										10								
1998																		
1999																		
94-99:				**46**	**752**	**576**	**12**	**14**	**8**	**10**	**51**	**116**	**3,002**	**2,890**	**23**	**36**	**3,894**	**3642**
80-99:				**83**	**1108**		**24**		**57**		**56**		**4464**		**169**		**5961**	**5882**

Table 1: Live Cattle imports. Shading indicates period of different risk that UK-exports carried the BSE agent, 1988-1993 being the period of highest risk. Sources of data: CD= Country Dossier, EU = NIMEXE data (1980-1987) and EUROSTAT (1988-1999), UK=UK-export statistic (1980-1996). The numbers provided in the CD per year reflect the numbers of animals already backtracked. The overall number of animals imported by Brazil is given in the last row (80-99), it follows that the year of import of the animals not yet traced back, is not known.

On the imports from UK the following information was provided:

- Seventy-nine live cattle were imported from the UK in the period 1980-87. The Brazilian authorities provided data on their origin and fate as follows (the UK authorities, upon request, stated that they don't have any records on these exports). All animals were born between 1976 and 1983 and of the Galloway, Normando and South Devon breed. Only 5 animals were male and almost all of them lived in the state of Rio Grande do Sul. The animals were followed by federal veterinarians by carrying out sanitary checks on the holdings and were monitored for any BSE related symptoms. The originating farms in UK were traced back and none of the animals originated from a BSE affected farm. After the animals died, they were all buried on the farm where they were kept (detailed data on all 79 animals were provided).
- In 1989 and 1990, 179 high value Jersey and Charolais breeding stock were imported from UK, also according to Eurostat and UK export data. The Brazilian veterinary services visited the farms of origin of the imported cattle in the UK and found no evidence of a BSE outbreak in any of them. Since the importation, all animals and their offspring are monitored for neurological signs by the official veterinarians who had been trained on detection of CNS symptoms and sampling. At import, their age was as follows: 1-2 years (82 animals); 3-4 years (44 animals); 5-6 years (52 animals); and 1 animal over 6 years. So far, 82 out of these 179 animals died of different causes; all were buried on the farm and 10 were submitted for BSE laboratory diagnosis because of neurological symptoms, with negative results (see also under "surveillance"). The remaining 97 animals are still alive and are monitored by the veterinary services. None has shown neurological signs so far. Individual details on all imported animals are provided in the country dossier. Obviously these are now also excluded from entering the food and feed chain in Brazil.

For imports from other BSE-affected countries the following was found:

- Brazil imported significant numbers of cattle from other BSE-affected countries, 5,961 according to the country import data, 5,882 according to Eurostat export data.
- According to the country dossier these imports are under surveillance by the official veterinary service and no BSE signs have been detected so far.
- All animals were imported because of their high genetic value, for improving the genetic make-up of beef (85%) and dairy (15%) herds. The farms that received these cattle are located in 20 out of 27 states throughout the country. The predominant breeds were Brown Swiss, Simmental, Limousin and Holstein.
- In order to clarify the fate of these cattle, the Brazilian Animal Health Authorities carried out a tracing exercise that relied on 3 main data sources:
  - the breed-specific breeder associations, where imported breeding stock are registered and are given a national identification number;
  - the Ministry of Agriculture and Food Supply, that issues the import permits;
  - the Federal Revenue Service, through its registry of animals.

Some discrepancies were identified among these data sources. They have been cross-checked in order to improve the reliability of the tracing system and also to comply with the Normative Instruction N°8 of 13 February 2001 (cf. infra). This instruction ensures that all cattle imported from BSE-affected countries that are still alive are excluded from the food and feed chain in Brazil.

In addition veterinary officers visited the farms to collect and compare data, and information provided by private veterinarians was also used to increase the consistency of the database.

- All imported breeding stock registered at the breeding-specific association are assigned a unique national number that is carried by the animal throughout its productive life. Moreover, most imported animals are eartagged on farm with an individual identification number. Although this is not mandatory, it is common practice in farms with good management systems such as those that import high value breeding stock. In addition, all farms are registered at a local official veterinary office where herd inventories are updated every six months. It was therefore possible to back-trace most (5812 out of 5961) of the cattle imported from non-UK BSE affected countries and to establish their fate.

Country of Origin	IMPORTED CATTLE				TRACEABILITY	
	Imported	**Alive**	**Slaughtered**	**Dead**	**Completed**	**Undergoing***
Germany	4464	2179	317	1885	4381	83
France	1108	603	99	406	1108	0
Italy	169	73	24	72	169	0
Switzerland	83	28	12	43	83	0
Belgium	14	4	1	6	11	3
The Netherlands	57	7	0	1	8	49
Denmark	56	23	2	26	51	5
Luxembourg	10	0	0	1	1	9
TOTAL	**5961**	**2917**	**455**	**2440**	**5812**	**149**

Table 2: Summary of traceability data concerning cattle imported in Brazil from non-UK BSE-affected countries. * Animals that moved from one state to another which are still being traced.

- Out of 5,812 cattle with complete information 2,917 are still alive. Of these, most are 8 years or older. A total of 2,440 cattle died of disease or accidents. The most common causes of death were babesiosis and anaplasmosis (24%), accidents (21%), bacterial and viral diseases (12%) and intoxication (5%). It was explained that tick-borne diseases, such as babesiosis and anaplasmosis, were the cause of death of many cattle imported from Europe, shortly after arriving in the country; some died

during the quarantine period. It was further explained that many animals were bought relatively cheaply, thanks to favourable exchange rates during a certain period in the 90s, which made prevention and/or treatment not worthwhile. The high percentage of accidents is explained by the extensive free ranging of cattle, which makes them more susceptible to accidents. According to the country dossier, all 2,440 bovines that died were destroyed and buried on farm. In no cases were symptoms pointing to BSE apparent.

- Only 455 (8% of all traced import cattle) were slaughtered, mainly because of infertility. Details on the age distribution of the slaughtered animals and on the reasons for slaughter are given in table 3. It shows that out of the 455 animals 326 were younger than 8 years and 320 of these entered rendering. The overall number of animals that entered rendering is 436 throughout the whole period (19 were slaughtered at the farm for own consumption).

Reason for slaughter	≤ 2	3 to 7	≥ 8	**TOTAL**
Slaughter at the farm for its consumption	2	4	13	**19**
Slaughter for ending the cattle production	0	16	15	**31**
Reproductive problems	5	227	74	**306**
Chronical Mastitis	0	29	12	**41**
Lameness	0	35	15	**50**
Trauma	5	3	0	**8**
TOTAL	**12**	**314**	**129**	**455**

Table 3: Reason for slaughter per age category.

- Most of the animals imported after 1990 are still alive (2,917 in total). A tracing system dealing with cattle imported from all European countries with a BSE risk (see above) has been installed. It aims to gather data on age, gender, breed and production purpose, as well as on the date and cause of death, and fate of animals disposed of. As an example of the kind of data generated by the system, detailed information on the breeding cattle of 6 farms, imported from EU Member States, has been made available to the assessors.

The tracing system also provides the basis for the effective implementation of the Normative Instruction n°8 of 13 February 2001. This instruction obliges stockowners to sign a Term of Agreement, under which imported animals are going to be destroyed at the end of their reproductive life, with compensation. It also determines that these animals cannot be sold without previous authorisation issued by the official service.

As regards import controls, the country dossier specified that imports of bovines from countries with high (UK) and low (FR, IRE, CH) BSE incidence were suspended in 1991 by normative instruction of 07/1991. However, the normative instruction of 11/92 allowed import of bovines from low-incidence countries (FR, IRE, CH, DK[1]). On 8/9/93 Oman was added to the list of low incidence countries by normative instruction n°3.

The preliminary authorisation of an importation of animals or animal products is formally given by issuing a document for each consignment based on the approval of an international animal health certificate.

2.2 Import of MBM or MBM-containing feedstuffs from BSE affected countries

According to Eurostat and the country dossier only negligible amounts of MBM were exported to Brazil: 200 kg from France in 1992 and 146 kg from UK in 1997.

Legal provisions to control and prevent the import of ruminant derived animal feedstuffs from BSE-affected countries, have been established since 1991.

2.3 Overall assessment of the external challenge

The level of the external challenge that has to be met by the BSE/cattle system is estimated according to the guidance given by the SSC in its final opinion on the GBR of July 2000.

According to this methodology, the live cattle imports into Brazil represented a very low external challenge until 1988, a high external challenge between 1988 and 1993 (mainly due to live cattle imports from UK) and a moderate external challenge after 1993. However, according to the information on the fate of the imported cattle, provided in chapter 2.1, only a limited number of cattle entered the Brazilian rendering system, namely those that were slaughtered in abattoirs that have a rendering plant attached.

- Apparently none of the UK-imported cattle were rendered.

- Of the 5,961 cattle that were imported from other BSE-affected countries, 436 entered rendering and 149 have still not been traced. Broken down by period it follows that 36 animals were rendered between 1980-87, 158 between 1988-93, and 242 between 1994-99. As these are the only ones that could have represented an external challenge, it is concluded that they represented a negligible external challenge. In other words it is highly unlikely that the BSE agent could have entered the Brazilian BSE/cattle system by this route.

- Obviously, this assessment depends fully on the information about the fate of animals imported from the UK and other BSE-affected countries that was provided by the Brazilian Government. However, the assessors had no reasons for not accepting the assurances provided both for the fate of the dead animals and for the live cattle as of their exclusion from the feed cycle.

[1] DK experienced in 1992 its first imported case, DE also, but apparently DE was not included into this list of low incidence countries.

- The very small imports of MBM did not pose an external challenge.

Overall External Challenge experienced by BRAZIL				
External challenge		***Reason for this external challenge***		
Period	**Level**	**Cattle imports**	**MBM imports**	**Comment**
1980 - 1999	**Negligible**	**Negligible**	**Negligible**	

Table 4: External Challenge resulting from live cattle and/or MBM imports from the UK and other BSE-affected countries. The challenge level is determined according to the SSC-opinion on the GBR of July 2000, but taking into account the fate of the animals at the end of their productive life.

Table 4 reflects the fact that apparently only a small fraction of the imported cattle was rendered, and none of the cattle imported from the UK. On the basis of the information provided by the Brazilian Authorities it is therefore concluded that the relatively high imports did only lead to a negligible external challenge.

3. STABILITY

3.1 Overall appreciation of the ability to avoid recycling of BSE infectivity, should it enter processing.

Feeding:

- An RMBM-to-ruminants feeding ban was installed in 1996 by Directive 365 of 3/7/96.
- Since the 1st February 2001 an MMBM-ban exists. Normative Instruction n° 6 bans the production, importation, commercialisation and use of mammalian-derived protein and fat to be used as ruminant feed (MMBM-ban). If this mammalian-derived protein and fat comes from a BSE-affected country it is even prohibited to be used for other animal species. As from 1st February 2001 compulsory laboratory testing for the identification of proteins included in feedstuffs for ruminants has also been introduced (according to procedures set by the Animal and Plant Health Secretariat). The instruction also aims at improving the system for the inspection of products to be used as animal feed, according to the HACCP principles.

The general husbandry system for Brazilian cattle is extensive pasture. The climate and soil conditions make it possible to maintain cattle on pasture almost year round across the country, both for beef and dairy herds. This renders the need for supplementary feeding minimal.

- The main beef production systems are:
  - extensive, based on native pastures, sometimes on cultivated pastures with rare feed supplementation for a small fraction of the herd,
  - improved beef systems, combining pasture with feed supplementation and/or confinement of most of the herd, using silage, hay and grains and a

greater quantity of correctives and fertilisers in the pastures (about 1.5 million). All concentrates are of vegetable origin.

- The main milk production systems are:
  - extensive, based on native pastures, sometimes on cultivated pastures with rare feed supplementation for a small fraction of the herd. In 1999, the milk production was estimated at about 19 million litres, varying between 14.5 and 19 million litres since 1990 (average production of 4.9 litre/cow/day, or 1,323 litres per year).
  - Only higher yielding cows (not more than half a million for the whole country) receive significant amounts of supplementary feeds (all of vegetal origin) and minerals. This population is seen to be most at risk of accidentally receiving feed contaminated with ruminant derived materials.

The exclusive use of vegetable protein in ruminant feed is justified on economic and productivity grounds, insofar as vegetal protein compares favourably in terms of feed conversion and cost (Table 5). It should also be kept in mind that Brazil is a major soy producer and exporter. Another justification given by Brazil for not using any proteins of animal origin in ruminant feed is that the milk price is low which makes it largely uneconomic to use protein enriched rations in dairy production. Moreover, the non-utilisation of proteins of animal origin also reduces the sanitary risks for feed producers and feed users. To compose the cattle rations, fats from vegetable or fish origin are added as well as minerals (registered by the Ministry of Agriculture and Food Supply).

Raw material	**Mean R$/ton**	**Standard deviation R$/ton**	**Median R$/ton**
Calcareous	41,69	4,88	42,95
Cotton bran with 30% of gross protein (GP)	158,24	41,18	145
Cotton bran with 40% of GP	**186,45**	**47,65**	**165,33**
Raw rice flour	117,38	13,54	118,33
Solvent rice flour	126,75	17,09	127,50
Soya flour	230,09	58,94	221,33
Wheat flour	107,72	15,98	106,68
MBM with 38/40% GP	**248,41**	**55,90**	**251,67**
Meat meal with 43/45% GP	**268,31**	**58,10**	**270,00**
Phosphate bicalcium	358,68	63,09	335,00
Powdered molasses	130,00	12,64	128,25
Whole wheat corn crushed	142,16	23,73	143,00
Corn flour gluten 60% GP	424,88	90,39	460,00
Sodium bicarbonate	95,17	10,52	98,75
Urea	299,27	40,04	288,75

Table 5: Mean, standard deviation and median of the prices in Brazil for one ton of the main components of feedstuffs for animals, over the period 1990-1999.

The country dossiers provides details on feeding practices indicating that MM, BM, and feedstuffs containing MBM, MM, BM or greaves are not and were not voluntarily fed to cattle.

Very little information on feedmills (types, annual production, type of feed produced) was provided. However, domestically produced animal meals are used for non-ruminant feeds, some of it produced in the same feed mills and in the same

production lines as cattle feed. As no feed controls were carried out it is therefore assumed that cross-contamination of cattle feed with (R)MBM is likely to have occurred.

This likelihood was higher before 7/96, i.e. before the first RMBM-ban because until then there was no legal obligation to undertake specific efforts to minimise cross-contamination.

It is therefore assumed that intensively managed dairy and beef cattle (about 2 million animals) might have occasionally received ruminant proteins until 7/96 and still thereafter, due to the lack of controls on the finished product.

Since the new Instruction of the 1st February 2001 came into force, it can be assumed, pending on the outcome of controls performed, that MBM is no longer fed to cattle.

Rendering:

The rendering process used in Brazil is an open (atmospheric pressure) batch-type rendering at 140°C for 180-240 minutes. The steam used to heat the system has a pressure of 3-4 bars. Particles entering the digester are ground to a size of 5-10 cm^3. This process is considered to be not equivalent to the EU standard of $133^{°C}/20^{min}/3^{bar}$.

Bovine raw materials, including bovine brains and spinal cord, non-edible and rejected edible offal, condemned materials, blood and bones derived from animals declared fit for human consumption are rendered for feed.

The national annual production of MBM is about 140,000 to 150,000 tons. All rendering material comes from animals that have passed the ante mortem inspection and are slaughtered in approved and controlled slaughterhouses. Animals that are assessed in ante mortem inspection as not being fit for human consumption, or animals submitted to emergency slaughter are slaughtered in separate plants and incinerated afterwards.

Rendering plants are located close to slaughterhouses. They are subject to the same Federal Inspection Service rules that apply for the abattoirs. In Brazil there are 78 slaughterhouses authorised for pigs and bovines slaughter, about 40 of them slaughter both. Some equipment may be shared but thorough cleaning and disinfecting are carried out between different slaughter cycles.

Domestic rendering production is always processing only one species: either cattle or pig. Separated processing lines ensure complete segregation. In the case of slaughterhouses processing both species, cattle and pig raw material is rendered in separated/dedicated plants within the abattoir. Until 1/2/2001 it was legal to include non-ruminant MBM in ruminant feed. If there were no such separate lines, the produced meals could not be used in rations for ruminants. Since 1/2/2001 the production and use of mammalian protein for ruminant feed has been prohibited. Rendered fats are used in the soap industry.

SRM and fallen stock:

There is no SRM-ban and SRM have always been and are rendered together with other slaughterhouse offal from animals fit for human consumption.

Fallen bovine stock is destroyed and buried on the farm. Materials condemned in the post-mortem inspection at slaughterhouses are rendered. Animals that died during transport and at the slaughterhouse are examined (autopsy) and, if necessary, sampled (according to the Regulation of Sanitary and Industrial Inspection of Animal Origin Products). If contagious diseases are diagnosed, these animals are incinerated or "sterilised" (by heat treatment).

Cross-contamination:

There are 40 abattoirs where both cattle and pigs are slaughtered, and these have dedicated/separated rendering facilities for each species. Hence, according to the country dossier, the resulting MBM is normally composed of one single species. At the rendering plants, MBM is produced under permanent veterinary inspection. Non-ruminant MBM was allowed for ruminant feed until 01/02/01 and except for the separation of the production lines no measures against cross contamination of non-ruminant MBM with ruminant material have been described.

In order to avoid cross-contamination in feedmills, the process as well as the installations are inspected by the official services during production. Moreover, the daily production starts with the production of rations destined for horses, bovines, sheep and goats, which do not receive ingredients from animal origin. Rations for monogastrics (poultry, swine) are produced thereafter. They normally include animal proteins. Finally, wheat bran is passed-through to clean the whole system. The resulting feed is prohibited as feed for horses, cattle, sheep and goats. These controlling procedures have been adopted since 1976 (Ministerial Decree 76.986 of 6 January 1976). This Decree also foresees that products destined for animal feeding are registered.

The feed producers have invested in the development and improvement of procedures to avoid cross-contamination between feeds for different animal species in order to reduce the intoxication risk resulting from the incompatibility of some additives and some species. Official controls on cross-contamination are carried out at feed mills, but the feeds themselves were not analysed.

Since 7/97 labelling of cattle and pig feed is required and official controls are carried out on these labels, but not on the feed itself. It is assumed that these labels reduce the risk of cross-feeding to some extent.

From 1 February 2001 onwards, together with a generalised MBM-ban, a system of laboratory feed testing has been installed. It aims to ensure that no animal protein is present in feed stuffs declared to be made from plant material alone and hence to prevent cross-contamination of ruminants feed. Tests are carried out in an accredited laboratory of the Ministry of Agriculture and Food Supply (minimum 100 tests per week). Feed mills have already submitted samples to testing and out of the 180 tests carried out until the end of March 2001, none were found positive for animal protein. The system will be developed towards a systematic sampling at feed mills.

Very few farms in Brazil are engaged in co-farming of intensive cattle production and intensive pig or poultry production. The latter are traditionally carried out in

specialised systems under which farmers are not allowed to keep more than one species on-farm. The possibility that a cattle producer would use animal meals intended for pigs or poultry of the same farm is therefore, according to the CD, regarded to be negligible. However, the existence of small-scale multi species farms cannot be excluded and hence neither the potential of accidental access of cattle to MBM containing pig/poultry feed.

It is concluded that cross-contamination of ruminant feed with ruminant (or other animal) protein might have occurred in the past, before and after the 1996 RMBM-ban. Subject to the verification by the planned systematic feed sampling, at present cross-contamination seems to be much less likely than until end of January 2001.

Conclusion on the ability to avoid recycling

About 2 million cattle receive supplementary feed that could be cross-contaminated with (ruminant) animal protein, which in turn is produced by rendering processes not able to significantly reduce BSE-infectivity. It is therefore likely that the BSE agent should it have entered rendering, would have been recycled and over time, propagated.

In light of the recent improvements concerning the feed-ban and its controls, it may be assumed that in the future the risk of recycling would decrease.

3.2 Overall appreciation of the ability to identify BSE-cases and to eliminate animals at risk of being infected before they are processed

Cattle population structure

The total cattle population of Brazil is about 153 million heads of which about 32 million are dairy cows, the remaining being dual-purpose or beef cattle. The total population over 24 months is about 105 million heads.

		Total (all ages)	Over 24 months old						
			male			female			
Period			**meat**	**breeding**	**work**	**meat**	**dairy**	**breeding**	**work**
1980-1984	n°	118,085,872	15,595,070	2,280,683	2,198,313	**	12,411,206	53,254,443	-
	age*	...	4-4,5 years	12-15 years	10 years	4-4,5 years	7,0-9,0 years	12-15 years	-
1985-1989	n°	128,041,757	19,367,442	2,409,647	2,355,425	**	13,384,924	56,477,520	-
	age*	...	4-4,5 years	12-15 years	10 years	4-4,5 years	7,0-9,0 years	12-15 years	-
1990-1994	n°	...	...	...	...	...	...	...	-
	age*	...	3-4 years	12-15 years	10 years	3-4 years	7,0-9,0 years	12-15 years	-
1995-1999	n°	153,058,275	20,462,909	2,919,280	1,702,657	**	13,722,613	66,264,545	-
	age*	...	3-4 years	12-15 years	10 years	3-4 years	7,0-9,0 years	12-15 years	-
Current	n°	153,058,275	20,462,909	2,919,280	1,702,657	**	13,722,613	66,264,545	-
	age*	...	3-4 years	12-15 years	10 years	3-4 years	7,0-9,0 years	12-15 years	-

Table 6: Key data on the cattle population in Brazil (age*: average age at slaughter) (**) The minimum and maximum number of slaughtered females among 1991 and 1999 was 15.875.912 and 12.169.400. For these animals, the average age at slaughter is similar to the male age of slaughter. (...) data not available; Source: IBGE - Censo Agropecuário-Brasil.

The specialised beef herd (e.g. industrial cross-breeding) is estimated at about 20 million cattle of which 1.5 million are reared in intensive and confined production systems, where additional feeding is provided.

About 500,000 cows are intensively managed for higher milk yield.

The average age at slaughter of beef cattle is 3-4 years, of dairy cattle 7-9 years and of breeding cattle between 12-15 years.

Surveillance and culling

- **Notification** of BSE has been compulsory since 12/97. All exotic diseases have been notifiable in Brazil since 1934. In 1997 BSE and scrapie were included in the list of diseases to which emergency measures, such as destruction of cases and contacts and compensation of stockowners are to be applied.
- No detailed description is given of the criteria for a BSE-suspect, but surveillance of CNS symptoms has been carried out under the rabies surveillance system, which commenced in 1976. This is based on clinical observations (neurological symptoms), as well as on histological, virological, bacteriological, toxicological and nutritional data to achieve a conclusive diagnosis. Since 1990, 2904 animals have been tested for BSE out of 9551 animals that have tested negative for rabies, in most cases because they showed signs of neurological disease (Table 7). No details on their age distribution are provided. None of them were diagnosed as a BSE case. It is worth noting that the material is collected and sent to the laboratory in compliance with procedures laid down in a purpose-developed manual (detailed sampling procedure described).
- **Surveillance procedure**

  In the Brazilian animal disease surveillance system the brain is collected from all animals with signs of neurological disease. When rabies is suspected the brain is sent to a regional laboratory of the rabies diagnostic network in the country (36 in total). Samples negative for rabies are forwarded to an accredited pathology laboratory for differential diagnosis, including BSE.

  When farm animals develop neurological symptoms the brain is commonly sent to a laboratory because rabies transmitted by vampire bats is widespread and causes significant production losses. When neurological diseases other than rabies are suspected, the eligible material is sent directly to the accredited pathology laboratory. BSE testing is undertaken regardless of other tests that might be performed but the diagnostic sequence follows the order of prevalence of the most relevant diseases in the region. Materials that have tested negative for babesiosis, botulism, hepatic encephalopathy, listeriosis, meningoencephalitis by bovine herpes virus, toxoplasmosis, polyencephalo-malacia, amongst others, are examined for BSE. The BSE examination may be undertaken even if the sample has already tested positive for another disease. Not all samples that tested negative for rabies could be submitted for BSE examination because of insufficient quantity of test material or its improper condition, or because another diagnosis was confirmed in the herd. This points to a certain risk that BSE positive samples could have been included in the brains that were not tested for BSE (Table 7).

  Cattle imported from UK are submitted to a histopathological examination for BSE whenever neurological signs arise and the cause of death has not been

established. Since 1991 surveillance for BSE has been targeted at cattle imported from UK. Of the 10 animals submitted to BSE testing 3 died of milk fever, 1 of ketosis, 1 of botulism and 5 of intoxication.

Since February 2001 the Ministry of Agriculture set up a contract with three accredited diagnostic laboratories at federal universities which have been carrying out BSE tests for some time. These laboratories have technical personnel that is fully updated and trained on BSE diagnosis. They will be able to increase the number of BSE tests as the service is to be paid through a contract established with the Ministry of Agriculture.

An active surveillance system will be targeted at testing high value and intensively fed stock, as these would be the animals at higher risk, despite being only fed vegetable feeds. It is also foreseen in legislation (Normative Instruction n°8 of 13 February 2001) that animals imported from countries with a BSE risk are submitted to BSE examination after death, irrespective of its cause, and subsequently disposed of.

- **Awareness / training** measures are in place but all in the context of the rabies awareness programme. A detailed description of brain sampling is provided (manual). Some laboratory training has been provided since 1980 (although it has to be assumed that this is not in the framework of BSE). Some training has taken place in the United States and in Europe.
- **Compensation** is foreseen for all exotic notifiable disease. This is regulated in Decree 24 548 of 3 July 1934, and Decree 27 932 of 28 March 1950. As BSE is an exotic notifiable disease, it is included in the list of diseases, to which sanitary emergency measures are applied, with destruction of animals and stamping-out, stockowners are entitled to compensation, should an outbreak occur.

During the last 10 years the number of CNS- suspects that were analysed annually for BSE (Table 7) were below the OIE requirements. Taking into account the over 24 months population of 105 million, it is clear that the 200-350 samples taken annually are insufficient. All analyses have been carried out in the context of the rabies control programme. The method used for the examination and confirmation of BSE-suspects has only been histopathology.

- Up until now there have not been any domestic nor imported BSE suspects in Brazil.

Active surveillance has not been carried out (e.g. sampling of non-suspect cattle) until very recently (February 2001).

On the basis of the available information (n° of annually examined bovine brains below OIE requirements, potential to not detect BSE in CNS-suspects due to sample processing and handling procedures, and no active surveillance), it cannot be assumed that the surveillance was able to detect small numbers of clinical BSE-cases.

The improvements from the recently introduced efforts to implement an active surveillance of at risk populations cannot be assessed until further information and first results are available.

Year	Rabies^{+}	Rabies^{-}	Number of Rabies^{-} examined for BSE
1990	566	527	216
1991	662	678	160
1992	739	758	337
1993	935	981	284
1994	892	914	295
1995	1053	1127	368
1996	1083	1190	341
1997	1124	1058	127
1998	1150	1207	271
1999	868	815	282
2000*			223
Total	**9072**	**9551**	**2904**

Table 7: Laboratory diagnosis for rabies in bovine nervous tissue and surveillance of imported animals and of animals with neurological symptoms sampled between 1990-00. Source: Country dossier. *: Up till October 2000.

3.3 Overall assessment of the stability

For the overall assessment of the stability the impact of the three main stability factors (i.e. feeding, rendering and SRM) and of the additional stability factors, mainly cross-contamination and surveillance plus culling, has to be estimated. Again the guidance provided by the SSC in its opinion on the GBR of July 2000 is applied.

Feeding: Out of 150 million Brazilian cattle about 2 million cattle receive supplementary feed, particularly the 0.5 million dairy cattle that are intensively managed for higher milk yields. Feeding of any MBM to cattle was legal until 1996, when an RMBM-feed ban was introduced. However also after this time feeding would have most likely happened due to cross-contamination (no feed controls). Therefore feeding is assessed as “not OK” before and after the 1996 feed-ban. The recently installed MBM-ban may render this stability factor “OK”, pending the outcome of verification.

Stability of the BSE/cattle system in BRAZIL over time					
Stability		**Reasons**			
Period	**Level**	**Feeding**	**Rendering**	**SRM**	**Other**
1980 to 2000	**Extremely unstable**	Not OK	Not OK	Not OK	↓

Table 8: Stability resulting from the interaction of the three main stability factors and other factors. The Stability level is determined according to the SSC-opinion on the GBR of July 2000. The "other" stability factors are reducing the stability: cross-contamination is possible and BSE-surveillance is not fully appropriate.

Rendering is considered “not OK” throughout the reference period because the process parameters are not equivalent with the EU standard (atmospheric pressure).

SRM removal is "not OK" throughout the reference period because SRM are rendered for feed, even if fallen stock is not rendered.

Other factors: BSE-surveillance has been focused mainly on rabies, and it was therefore not satisfactory until February 2001, when active surveillance was installed. Cross-contamination of cattle feed with MBM was possible before the feed-bans and even after that, because of the lack of feed controls until February 2001.

4. CONCLUSION ON THE RESULTING RISKS

4.1 Interaction of stability and challenges

The conclusion on the stability of the Brazilian BSE/cattle system over time and on the external challenges the system had to cope with over time are summarised in the table below. From the interaction of the two parameters "stability" and "external challenge" a conclusion is drawn on the level of "internal challenge" that emerged and that had to be met by the system, in addition to external challenges that occurred.

INTERACTION OF STABILITY AND EXTERNAL CHALLENGE IN BRAZIL			
Stability		**External Challenge**	**Internal challenge**
Period	**Level**	**Level**	
1980- 1988	**Extremely Unstable**	**Negligible**	**Highly unlikely**
1989- 1991			
1992- 1995			
1996-2000			

Table 9: Internal challenge resulting from the interaction of the external challenge and stability over time. The internal challenge level is determined according to guidance given in the SSC-opinion on the GBR of July 2000.

Since 1980 an extremely unstable system was exposed to only negligible external challenges. Although significant live cattle imports have taken place it could be convincingly demonstrated that no UK-imported cattle, and only relatively small numbers of cattle imported from other BSE-affected countries entered rendering. Hence the risk that the BSE agent started to be recycled by the extremely unstable system is negligible and it is highly unlikely that an internal challenge developed in the country.

It is recognised that this assessment fully relies on the certification by the Brazilian Government that cattle imported from UK and other BSE-affected countries have been and will continue to be excluded from the feed chain. Should that not have been the case, it is clear that an internal challenge would have arisen and would be

increasing. However, the assessors have no reason to doubt the information provided by the Brazilian Veterinary Authority.

4.2 Risk that BSE infectivity entered processing

A risk that BSE-infectivity entered processing occurred when cattle imported from BSE-affected countries were slaughtered in abattoirs. However, the number of these cattle was so low that the processing risk remained negligible.

4.3 Risk that BSE infectivity was recycled and propagated

Given the fact that the system was extremely unstable, BSE infectivity would have been recycled and propagated within a distinct part of the cattle population, if it would have entered processing. Given that this risk was negligible the propagation risk is also negligible.

5. CONCLUSION ON THE GEOGRAPHICAL BSE-RISK

5.1 The current GBR as function of the past stability and challenge

The current geographical BSE-risk (GBR) level is *I, i.e. it is highly unlikely* that domestic cattle are (clinically or pre-clinically) infected with the BSE-agent**.**

Note: This assessment is fully dependent on the information on the fate of the cattle imported into Brazil from BSE-affected countries that were provided by the Brazilian Authorities.

5.2 The expected development of the GBR as a function of the past and present stability and challenge

- If the stability of the system in Brazil remains as low as it was, any external challenge would lead to an increase in the GBR of the country.
- Enforcement of the Normative Instruction n°8 by which all remaining live cattle that were imported from BSE-affected countries will be destroyed at the end of their productive lives is essential.
- The recently initiated measures, however, are potentially increasing the stability of the system and could make it less vulnerable to external challenges.

5.3 Recommendations for influencing the future GBR

- In order to improve the stability of the Brazilian BSE/cattle system, it is of highest priority to ensure that cattle do not receive any mammalian protein. To this end cross-contamination of cattle feed with mammalian protein has to be avoided. The recently started feed controls are essential for confirming the efficiency of the measures taken.

- Excluding SRM from rendering and improved rendering processes are other options to improve the stability of the system.

- The improvement of the passive surveillance as well as the adoption of an active surveillance system did already start in February 2001. It will provide additional confirmation of the current assessment of the GBR and its development in the future.