

Report on
the Assessment of
the Geographical BSE-Risk
(GBR) of
MAURITIUS

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 suitable to finalise the GBR risk assessment.

Sources of data

Country dossier (CD) consisting of:

- Completed questionnaire for the assessment of the Geographical BSE-risk of Mauritius transmitted on November 20, 2000 by the Embassy of the Republic of Mauritius.
- Clarifications and comments on the draft report for the assessment of the Geographical BSE-risk for Mauritius, sent by the authorities on 12 January 2001.
- Additional clarifications and comments on the draft report during a meeting on 22 February 2001.
- Additional clarifications in reply to the questions formulated during the meeting on 22 February 2001 (received on 09/03/2001).

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 EU Member States covering the period 1980 to 1999.
- Information received from the French company that exported animal proteins to Mauritius (data from the period 1991-1999) (received 30/03/01).
- 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**

According to the country dossier Mauritius has not imported any live cattle from the UK or any other country affected by BSE since 1980. The import statistic which was attached to the country dossier indicates that all cattle imported came from non European countries (Madagascar, South Africa, Zimbabwe and Australia).

Eurostat and UK export statistics also do not show any live cattle exports to Mauritius.

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

Import of MBM, MM, BM or greaves (t/year) into <u>MAURITIUS</u> from BSE-affected countries									
Period	UK			FR		BE		Non-UK	
Source:	CD	EU	UK	CD*	EU	CD	EU	CD	EU
1980					108				
1981					54				
1982					36				
1983		2	1.9		167				
1984				240	339	3			
1985				225	149				
80-85	0	2	1.9	465	853	3		468	853
1986				160	19				
1987				10.5	10				
1988				321	200		75		
1989				190			470		
1990				795			890		
86-90	0	0	0	1,476	229	0	1435	1,476	1,664
1991				50	20		560		
1992				225	20		320		
1993				451	1071				
91-93	0	0	0	726	1,111	0	880	726	1,991
1994				599	516				
1995				657	653				
1996				80	320				
1997									
1998									
1999									
94-99:	0	0	0	1,336	1,489	0	0	1,336	1,489

Table 1: MBM-imports. Shading indicates period of different risk that exports carried the agent, 1986-1990 being the period of highest risk for UK imports while 1994-1999 UK-exports are assumed to have been safer than exports from other BSE-affected countries. Sources: CD = Country Dossier, EU = Eurostat, UK = UK-Export statistics. *: this is the total of MM and BM imported into Mauritius. According to the French company, a total of 3420 tons of meat meal was exported from France in the period 1991-1999, the imports in 97 and 99 concerned fishmeal.

According to the country dossier Mauritius has not imported any MBM from the UK over the reference period 1980-1999, mainly for economic reasons. Eurostat and UK data show a negligible export of 1.9tons from UK to Mauritius in 1983.

Mauritius has, however, imported 3682t (Eurostat) to 4003t (CD) of MBM from France in the period 1980-99 (EU) or 1984-96 (CD) respectively. Data from the French export company show a total of 3420t during the period 1991-1999. Export of 2315t of MBM from BE to Mauritius were registered by Eurostat but not confirmed by BE. As Mauritius has not registered them as imports it is assumed that it was either a misclassification in the export statistics or that they were only sent to the free trade harbour of Mauritius for immediate transshipment.

The import figures provided by Mauritius cover the period 1984 until 1996 only, and concern MM, BM and blood meal. Before 1984, no records are available in the country.

Since 1996 import of MBM was prohibited but Eurostat registered some exports from France after this date. According to the information provided by the exporting company, it concerned fishmeal and hence it is not taken into account.

The imported MBM was largely used in poultry feed but according to the country dossier, before 1996 limited amounts may have also been used in cattle feed. In addition some of it might have ended-up in cattle feed due to cross contamination in the two major feed mills in the country that mainly produce poultry feed while 5% of their production is cattle feed.

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.

It appears that the challenge resulting from live cattle imports has been negligible all over the reference period 1980-1999.

The imports of MBM posed a moderate external challenge from 1980-1985 and a high challenge from 1986 to 1996. After 1996 the external challenge is negligible.

External Challenge experienced by <u>MAURITIUS</u>				
<i>External challenge</i>		<i>Reason for this external challenge</i>		
Period	Level	Cattle imports	MBM imports	Comment
1980 - 1985	Moderate	Negligible	Moderate	MBM imported from FR
1986 - 1996	High		High	
1997 - 1999	Negligible		Negligible	

Table 2: 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.

In view of this external challenge it is regarded to be likely that the BSE-agent entered the country in the period 1986-1996 by means of MBM-imports.

3. STABILITY

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

Feeding:

According to the country dossier, feeding MBM to all farm animals has been prohibited in Mauritius since 1996. Feed controls are not carried out because since

July 1996 import of MBM has not been allowed and, as it is not produced domestically, has not been present in the country.

There are two main feed mills producing animal feeds in Mauritius. Over 100,000 tons of feeds are produced annually but cattle feeds represent less than 5% of the total production. The cost of commercially produced animal feed is high and cattle breeders consider it uneconomical to feed concentrates to their animals. Soybean meal costs 15% less than MBM and is therefore used as the source of protein.

The country dossier states that the normal cattle rations consist of sugar cane tops, molasses, urea and minimal concentrate supplementation. Concentrates are normally made up of maize, soy, wheat bran, minerals and vitamins. Pure cotton seed cake imported from Australia constitutes the main protein component of cattle concentrates. However, it also was stated that "limited amounts [of the imported MBM] have been used in cattle feeds".

Since the prohibition of MBM imports in 1996, it is assumed that the domestic concentrates do not contain any MBM.

At local level, feed mills are licensed by relevant authorities such as local bodies of the Ministry of Health. The health inspectorate of this Ministry visits the mills as and when necessary. New legislation makes provision for better veterinary controls over feed mills. No details are provided on what kinds of controls are performed, or on their results.

Rendering:

A rendering industry does not exist in Mauritius.

This is convincingly explained by a lack of raw material for production as only about 100 cattle are slaughtered per week. Condemned material from the abattoir is sent to authorised landfills. In the country dossier it is certified that all the abattoir waste is treated with disinfectants and transported to the dump, where they are subject to compaction and deep burial.

SRM and fallen stock

Brain, spinal cord etc. from healthy animals are destined for human consumption.

Fallen stock is disposed of by incineration or in the case of material coming from the abattoir (dead animals and condemned material) by deep burial in landfill.

Cross-contamination:

There are two major feed mills in Mauritius (+ one smaller one). Until the import ban on MBM in 1996, these feed mills processed MBM together with other feed ingredients. No measures were taken to prevent cross contamination of the cattle feed produced in these mills (5% of their annual output) with MBM.

After the import ban MBM has not been used anymore. Because it has not been present in the country, feed controls are not carried out.

It is assumed that cross-contamination occurred as long as MBM was available in the country (until 1996) and that it would still happen if MBM were present in Mauritius.

Conclusion on the ability to avoid recycling

Because of the absence of a rendering industry in the country it is concluded that the BSE agent, should it have entered the territory of Mauritius, would not have been recycled. However, imported MBM could have reached domestic cattle as long as it was available in the country, i.e. at least until 1996.

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 herd structure is given in Table 3.

Period	Total number of animals	Dairy animals
1980-1984	14,935	-
1985-1989	22,677	8,381
1990-1994	22,129	9,915
1995-1999	21,799	7,453

Table 3: Herd structure in Mauritius.

In Mauritius only one beef farm, comprising over 1,500 bovines, and one large dairy with less than 150 heads exist. Small breeders who keep only 1-2 bovines for a side-business on a part-time basis for some additional income, keep the rest of the herd. The beef farm produces its feed itself. Small breeders often collect the feed for their cattle on public land (along the streets) or use agricultural or agro-industrial by-products such as sugar cane tops or molasses. MBM is said to be never used, neither by the large farms nor by the small breeders.

Multi species farming is not common practice in Mauritius. Few farms rear cattle and goats together but rearing of cattle together with pigs and poultry does not exist. No information is provided on the milk yield, but it is mentioned that almost all dairy products are imported into Mauritius and that local production is only used for fresh milk production for domestic use.

Surveillance and culling

At present, only a general legal provision for compulsory notification of all animal diseases exist. A new law (Veterinary Services Act) which provides for certain diseases (such as BSE) to be notifiable has been passed by the National Assembly, and was foreseen to be promulgated by 1 March 2001.

Independent of this, the official veterinary services maintain a strict surveillance of all animal diseases. Governmental Veterinary officers attend almost all cattle holdings in the country and report all new diseases to the headquarters. There are 44 veterinarians in the country and over 80% of them are employed by the veterinary services. They offer a 24 hour-service free of charge to all livestock breeders. There is hence an interest to report all diseased animals.

Each animal dying of natural causes is recorded and compensated by the government at 100% of its market value. For other causes up to 80% of its market value are reimbursed. There is hence an interest to report every dead animal.

Almost every veterinary officer has received post graduate training abroad. Awareness / training measures for BSE are in place since 1991. Regular correspondence between the Mauritius and the UK veterinary services has taken place on the BSE subject and video material was provided. In 1996 the chief epidemiologist from UK gave a seminar on BSE. In addition, the veterinary services conduct an almost weekly programme on continuous veterinary education including amongst others BSE.

Criteria for a BSE-suspect are defined. They are limited to CNS symptoms and notification depends entirely on the judgement of the veterinary officer.

During the last 10 years no CNS-suspects were analysed for BSE, since no specific surveillance system for BSE had been set up. Samples of suspects would be sent to an OIE reference laboratory for confirmation. It appears that Mauritius does not yet have laboratory pathologists in the country to examine suspects.

No active surveillance measures are in place.

3.3 Overall assessment of the stability

For the overall assessment of the stability the impact of the three main stability factors 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 are applied.

Feeding: Feeding MBM to cattle was legally possible until 1996 and a limited amount of the imported MBM is said to have reached cattle. The stability factor feeding is therefore assessed as "not OK" until 1996.

After 1996 the combined effect of the feed ban and the import ban for MBM made feeding of MBM to cattle highly unlikely. However, if MBM was to be present in the country, it could still reach cattle because no feed controls are carried out and about 5% of the annual production of the feed mills are destined for cattle. It is therefore assumed that feeding is "reasonably OK" since the feed ban in 1996.

Rendering: There is no rendering industry in Mauritius and sub-industrial rendering can be excluded as well, therefore rendering is assessed to be "OK".

SRM-removal: There is no SRM ban but the human population consumes brains and spinal cord of cattle. Fallen stock and condemned material, including SRM, is burned or buried. SRM removal therefore is considered to be "OK" because SRM cannot enter the cattle feed chain.

Other stability factors: Cross-contamination with imported MBM did most likely occur in the past and could probably still occur, should such imports happen. BSE surveillance is found to be satisfactory. The "other factors" therefore tend to have a neutral effect on the stability since 1980.

On the basis of the available information it has to be concluded that the country's BSE/cattle system was stable until 1996 and is very stable since 1997.

Stability of the BSE/cattle system in MAURITIUS over time					
Stability		Reasons			
Period	Level	Feeding	Rendering	SRM	Other
1980-1996	Stable	Not OK	OK	OK	
1997- At current	Very stable	Reasonably OK			

Table 4: Stability resulting from the interaction of the three main stability factors and the other stability factors. The Stability level is determined according to the SSC-opinion on the GBR of July 2000.

4. CONCLUSION ON THE RESULTING RISKS

4.1 Interaction of stability and challenges

The conclusion on the stability of the Mauritian BSE/cattle system over time and on the external challenges the system had to cope with are summarised in the table below. From the interaction of the 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.

The BSE/cattle system of Mauritius was exposed to a moderate external challenge from 1980-1985 and a high one from 1985 to 96 due to imports of MBM from France. During this period the country's system was stable, i.e. it would not have recycled and amplified the BSE-agent, should it have entered the country.

However, as feeding was "not OK" imported MBM could have reached domestic cattle and it is unlikely but not excluded that an internal challenge developed. The order of magnitude of that challenge would have been proportional to the external challenge posed by the MBM-imports.

INTERACTION OF STABILITY AND EXTERNAL CHALLENGE IN MAURITIUS			
Stability		External Challenge	Internal challenge
Period	Level	Level	
1980-1985	Stable	Moderate	Not present
1986-1996		High	Presence unlikely but not excluded
1997- At current	Very stable	Negligible	

Table 5: Internal challenge resulting from the interaction of the external challenge and stability. The internal challenge level is determined according to guidance given in the SSC-opinion on the GBR of July 2000.

In view of this analysis the registered external challenge could have led to an internal challenge in the early 80's, if some of the MBM imports were already contaminated. However, this potential internal challenge met the stable system and infectivity was not recycled. Without further imports it would have disappeared with the infected cattle leaving the system. As the MBM imports from France

continued, a certain risk continued to exist for domestic cattle to be exposed to the agent. This risk vanished with the import ban of 1996, assuming that it was fully effective.

All in all it is assessed to be unlikely that an internal challenge resulted from the imports but it cannot be excluded and animals infected in 1996 could still be alive and represent an internal challenge.

4.2 Risk that BSE infectivity entered processing

The BSE-agent was probably imported in non-negligible quantities into the country and could have reached domestic cattle sometime in the eighties and until 1996. A low risk that BSE infectivity entered slaughtering therefore exists since the late 80s.

4.3 Risk that BSE infectivity was recycled and propagated

Due to the absence of a rendering industry, BSE infectivity could not have been recycled and amplified, even if incubating cattle would have been slaughtered or clinical cases would have died as fallen stock.

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 *II*, *i.e. it is unlikely, but not excluded* that domestic cattle are (clinically or pre-clinically) infected with the BSE-agent.

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

Domestic cattle could only have been infected by imported MBM. If the import ban of 1996 were as effective as assumed, the risk of new infection would have disappeared since 1997. Once the birth cohorts before that date have left the domestic cattle herd of Mauritius, the GBR-level will turn to be GBR-I; *i.e.* it will become highly unlikely that that domestic cattle are (clinically or pre-clinically) infected with the BSE-agent.

5.3 Recommendations for influencing the future GBR

All potentially incubating animals could only have been infected before 1997. They are hence at least 4-5 years old and, if infected, they would be far enough advanced in the incubation period to be identified by the currently available rapid screening tests. If no positives were found the GBR-level would be assessed as GBR-I.

Ensuring that (imported) animal protein could not reach domestic cattle would render the system less vulnerable to accidental or illegal imports of such proteins.