REPORT

ON THE ASSESSMENT

OF THE

GEOGRAPHICAL BSE RISK OF

BOTSWANA

FULL REPORT

1. DATA

- The available information was sufficient to carry out a qualitative assessment of the GBR.

Sources of data

Country dossier consisting of :

- Completed questionnaire for the assessment of the Geographical BSE-risk of Botswana, provided on 31/10/2000 and annexes.
- Clarifications and comments on the draft report for the assessment of the Geographical BSE-risk for Botswana received from the Veterinary Service of Botswana on January 11, 2001.

Other sources :

- EUROSTAT data on export of "live bovine animals" and on "flour, meal and pellets of meat or offal, unfit for human consumption; greaves", covering the period 1980 to 1999.
- 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

Botswana declares in its country dossier that no imports of live cattle from the UK or any other country affected by BSE have taken place from 1980 until present. This statement is supported by the UK-export statistic (1980-1996) and Eurostat export data (1980-1999) both showing no exports to Botswana during this period.

Botswana provided information that convincingly demonstrated that in the interest of trans-boundary animal disease control (mainly Foot and Mouth Disease) border controls exist and are properly implemented.

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

According to the country dossier Botswana has not imported any MBM from the UK or any other BSE affected country from 1980 until present. This statement is supported by the UK export statistic (1980-2000) and Eurostat export data (1980-1999). Information contained in the country dossier argues that there was and is no real incentive to import MBM mainly because the product was and is sufficiently available in the country and is cheaper than imported products.

Before 1998 the Director of Animal Health and Production (DAHP) did not issue any import permits. After 1998, there was a legal instrument (Statutory Instrument No. 101 of 1998) banning the use of RMBMs in Botswana.

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. On the basis of the available information the overall assessment of the external challenge is as given in Table 1.

External Challenge experienced by BOTSWANA				
External challenge		***Reason for this external challenge***		
Period	**Level**	**Cattle imports**	**MBM imports**	**Comment**
1980 until present	**Negligible**	**Negligible**	**Negligible**	

Table 1: 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.

It appears that, according to the available data, the external challenges from imports of live cattle and MBM from BSE affected countries have been negligible from 1980 until present.

3. STABILITY

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

Feeding

Since end 1998 there is an official feed ban of RMBM to ruminants in Botswana. The legal basis for the ban is Statutory Instrument 102 of 18.12.1998. Other farm animals can still be fed with MBM.

According to the country dossier, all cattle in Botswana are grazed on the "veldt". About 80-85 % of Botswana cattle are reared communally and 15-20 % are reared in fenced farms (ranches) each of at least 64 km^2 in size. Cattle in ranches are grazed on veldt in the same way as those in the communal grazing areas. Only 3% (1% before 1990) of cattle are kept in feedlots for finishing, the period of which can go up to 3 months, while the rest (97%) go to the market directly from grassland.

For feedlots, concentrated feed is either produced locally or is imported from neighbouring countries under veterinary supervision (veterinary import permit). It is specified that feedstuff must be free from ruminant proteins and that no

hormones are used. Prior to end 1998 it must be regarded as possible, albeit infrequent, that this very small sub-population of cattle could have been fed with MBM.

All dairy farms are registered with DAHP and are in fenced farms. Dairy farmers graze their animals as well but produce in addition supplementary fodder with subsidised MBM-free concentrate from the Livestock Advisory Centre (LAC) which is operated by DAHP. The type and amount of concentrates depend on the stage of production.

Rendering:

Bovine raw materials including SRM but excluding fallen stock were and are rendered for the production of carcass meal, bone meal and blood meal. Rendering to produce MBM and blood meals takes place only at two (export-associated) abattoirs. Bone meal is produced at a single company that processes material procured from the non-export abattoirs in the OIE recognised FMD free areas of Botswana. Process conditions for bone meal are 135°C at 3 bar for 2 hours. The plant is also subjected to spot checks by the competent authority (Department of Animal Health and Production).

Batch rendering at $133°C/20^{min}/3^{bar}$ is used. Rendering is said to take place under state veterinary supervision and cooking temperatures, time and pressure are monitored and recorded at intervals during the rendering process. Records are kept at all rendering plants. At export abattoirs, the process is subjected to HACCP and ISO 9002 standards.

Total annual production is 5000 tonnes for MBM and blood meals and 450 tonnes for bone meal. 90% of MBM and blood meal is exported to neighbouring countries and 10% goes to the local feed mill, where it is used for poultry feed production. All bone meal is exported to neighbouring countries.

From 1995 only MBMs and blood meals were produced at the export abattoirs, after operational restructuring. Bone meal production began in 1998 at the single company referred to in the first paragraph of this section.

SRM and fallen stock

There is no SRM-ban in Botswana and brain and spinal cord are rendered.

Fallen stock is, according to the country dossier, not used for feed production and is not allowed in abattoirs or feed mills. The carcasses are detained at veterinary inspection "kraals" where a post-mortem inspection is performed to determine the cause of death. Farmers are encouraged to bury or incinerate fallen animals after consultation with the DAHP field disease control officers.

Cross-contamination:

Since end 1998, when the feed ban was installed, measures to avoid cross-contamination are in place.

According to the country dossier there is no co-farming of ruminants and non-ruminants at an industrial scale. The risk of cross-contamination and cross-feeding at farm level is therefore negligible.

At the only feed mill, the ruminant and non-ruminant production lines are kept separate. Measures in place to control cross-contamination can be summarised as follows :

- Two separate lines for ruminant and non-ruminant feed production.
- No cross movement of operators between the two lines is allowed.
- Separate cleaning of each of the lines at end of each production takes place.
- Records of production processes are kept.
- Spot checks on controls by veterinarians.
- Transport means are swept and washed with detergent between loads. The truck driver keeps a record of cleaning cycles.
- The feed mill is cleaned at the end of every production day and waste material and refused materials are incinerated.

In addition, MBM production for non-ruminant feed is under strict supervision from Department officers and products are labelled "not to be fed to ruminants in Botswana". There is however no indication in the country dossier that specific testing of cattle feed for the presence of animal protein is carried out.

Conclusion on the ability to avoid recycling

In light of the above it has to be assumed that the BSE agent, should it have entered Botswana, is unlikely to have been recycled and amplified. Only a very small proportion of cattle receive supplements. Controls on rendering, feed and cross contamination are in place and there is only a small domestic use of MBM which is destined for the poultry industry.

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

According to the country dossier the overall cattle herd of Botswana consists of about 1.8 million heads of cattle with an average age between 2.5 - 3 years at slaughter. Botswana tends to slaughter cattle at a lower age in the export abattoirs (where MBM production takes place) due to price incentives.

There is only a very small dairy herd of 2673 heads (1384 milking cows) producing 3.5 million litres per year (2528 litres per head). About 60 % of the dairy population is over 24 months old. This percentage reflects a high proportion of females kept for breeding.

In the dairy industry, young bulls are sold to other dairy farms or to abattoirs. Imported dairy cattle are branded “NO EU” and are by law prohibited from being sold to export abattoirs. This serves a dual purpose by ensuring that beef derived from these animals is not exported to the EU and their remains do not enter the rendering process. (MBM is produced only in abattoirs associated with export and therefore largely with beef production from extensive herds).

Surveillance and culling

Notification of BSE is compulsory since 1998. The legal basis for this measure is said to be Chapter 37:01 the "Diseases of Animal Act" and specifically the Statutory Instrument 100 of 18.12.1998 thereof. There is no compensation scheme in place.

Awareness training for BSE began in 1997 through a number of seminars and workshops conducted by international experts including those from the UK. Two Veterinary Pathologists were trained at Onderstepoort Veterinary Institute (OVI) in the Republic of South Africa in 1997.

Histopathology only is used for the examination of cattle with CNS symptoms and potential BSE suspects. The examination method is said to be according to OIE standard and is described in detail in the country dossier. The criteria for confirmation of BSE are described as follows :

- Positive: Characteristic vacuolation in either the solitary tract or the spinal tract nucleus of the trigeminal nerve with a bilateral and symmetrical distribution.
- Inconclusive: Inadequate submission. Poor representation of lesion target sites/severe autolytic changes. Vacuolation of grey matter neuropil insufficient for confident histological confirmation. An alternative neuropathological diagnosis where lesions prevent adequate assessment of vacuolar change in BSE target sites.
- Negative: Absence of characteristic vacuolar change in the medulla at the obex. Lesions indicating an alternative neuropathological diagnosis which still allow adequate assessment of BSE target sites for absence of vacuolar change.

From September 1997 to December 1999, examination of cattle brains for BSE was as follows.

- 422 cattle with CNS signs were identified. Of these, 233 proved rabies positive and were not pursued further; 189 were negative for rabies, and tested for BSE. All samples were negative. This fulfils the OIE requirements. Differential diagnosis was made in relatively few cases, and in most no abnormalities were found. This is explained by the high importance of rabies leading to overreporting.

- 60 cattle presented with signs other than CNS. All were tested negative for BSE. In most cases non-specific diagnoses were made.

The surveillance for TSE/BSE does not yet include random sampling of asymptomatic cattle in risk populations such as adult cattle in fallen stock or adult animals which were subject to emergency slaughter. Further passive surveillance

measures include routine farm/cattle visits by DAHP field personnel in the context of vaccinations, FMD monitoring and sampling for residue monitoring programs.

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** of MBM to cattle was allowed until 1998 but apparently not frequently and the efficiency of the RMBM-ban of 1998 cannot be judged as no details on feed-controls are reported. This would result in assessing the stability factor as "reasonably OK" before and "OK " after the feedban. This latter assessment is exclusively due to the fact that 90% of the MBM and blood meal and all BM are exported, therefore stabilising the system in Botswana.

- **Rendering** is assumed to be able to reduce infectivity although no evidence for the appropriate application of the $133°C/20^{min}/3^{bar}$ is provided. The fact that ISO 9002 and HACCP standards are applied in the export plants allows however the conclusion that rendering can be assumed to be "reasonable OK".

- **SRM**-removal is "not OK" because SRM are rendered for feed.

Other factors:

- Some risk of cross-contamination exists since the same mill produces feed for poultry and cattle. However a number of measures are taken to reduce this risk. Surveillance measures currently undertaken are reasonable, but because the system is completely passive, it is insufficient to detect small numbers of BSE cases.

- An additional factor considered here is the very small size of the cattle population at risk from contaminated feed. Further, these dairy cattle are less likely to be sent to export abattoirs where all MBM is produced. "Other factors" therefore act to increase the stability.

Stability of the BSE/cattle system in BOTSWANA over time					
Stability		**Reasons**			
Period	**Level**	**Feeding**	**Rendering**	**SRM**	**Other**
1980 to 1997	**Neutrally Stable***	Reasonably OK	Reasonable OK	Not OK	
1998 until present		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. "Other" refers to the impact on the stability of other factors than the three main stability factors.

On the basis of the available information the BSE/cattle system is considered to be neutrally stable. Before the feedban was enforced, the feeding can only be considered as reasonably OK, but because cattle could hardly have access to MBM due to its exportation before and after the feedban, the system can anyhow be considered to be neutrally stable during the whole reference period. In particular the small size of the cattle population at risk from MBM feed and their likely exclusion from MBM producing abattoirs, as well as the export of most of the domestically produced MBM render the system "Neutrally stable". *

4. CONCLUSION ON THE RESULTING RISKS

4.1 Interaction of stability and challenges

INTERACTION OF STABILITY AND EXTERNAL CHALLENGE IN BOTSWANA			
Stability		External Challenge	Internal challenge
Period	Level	Level	
1980 until present	**Neutrally stable**	**Negligible**	**Highly unlikely**

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.

The conclusion on the stability of the 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 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.

Since no external challenge can be identified, the system is highly unlikely to have encountered an internal challenge.

4.2 Risk that BSE infectivity entered processing

In view of the negligible external challenge, it is highly unlikely that BSE entered processing.

4.3 Risk that BSE infectivity was recycled and propagated

If BSE-infectivity would have been processed, it is unlikely to have been recycled and propagated by the neutrally stable system. This is, however, exclusively due to the fact that most of the domestic MBM production is exported and therefore cannot reach domestic cattle.

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 favourable assessment is mainly depending on the negligible external challenge.

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

- As long as no external challenge occurs in the future, the GBR remains unchanged.

5.3 Recommendations for influencing the future GBR

- Improving the stability of the system would make the system less vulnerable to (accidental) introduction of the agent. For the stability to increase it is crucial that all checks are fully functioning for the exclusion of MBM from cattle feeds. Checks on rendering conditions and an SRM ban can also increase the stability.

- Improving the surveillance, by introducing other methods for the BSE-examination of cattle brains and by active surveillance of asymptomatic at-risk cattle populations by means of rapid screening, would increase the confidence that no animals in the country are infected with BSE.