

FINAL REPORT
ON THE ASSESSMENT
OF THE
GEOGRAPHICAL BSE RISK OF
KENYA
MAY 2001

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

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

1. DATA

Sources of data

Country dossier consisting of:

- Completed questionnaire for the assessment of the Geographical BSE-risk of Kenya as transmitted by the Veterinary Service on November 8, 2000.
- Answer of Kenya to the initial assessment report, received on 22 January 2001.
- Comments of the Veterinary authorities on the draft final report received on 06 March 2001.

Other sources:

- EUROSTAT export 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 2000.
- 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**

Table 1 provides an overview of the import of live cattle into Kenya, as provided in the country dossier (CD) and compares this with the exports from BSE-affected countries, as indicated in Eurostat and UK export statistics.

The import figures in the Country Dossier slightly differ from the UK and the EUROSTAT export data, however they are all in the same order of magnitude and the differences would not significantly modify the overall assessment.

Kenya imported live cattle from the UK and other BSE affected countries between 1980 and 1990.

Kenya states that no more live cattle were imported after 1990 as administratively, no import licences were issued since that date. This statement is confirmed by UK and EUROSTAT export data that indicate no exports to Kenya after 1990.

The ban was formally adopted through the publication of a text in the national Gazette on 2 December 1996 banning all imports of live cattle and of their products from BSE affected countries.

The majority of imported cattle came from the UK and were imported between 1980 and 1986.

Import of live cattle (n/year) into <u>KENYA</u> from BSE-affected countries													
Period	UK			DE		BE/Lux		IT	NL	DK		Non-UK	
	CD	EU	UK	CD	EU	CD	EU	CD	EU	CD	EU	CD	EU
1980		52	75						3				3
1981	6	19	19	13	4				5			13	9
1982	32	20	20					18				18	
1983	32	10	10							7		7	
1984	10	7	7								3		3
1985	1	6	6	1								1	
1986	10	5	5			12	9					12	9
1987													
80-87:	91	119	142	14	4	12	9	18	8	7	3	51	24
1988				1	12							1	12
1989	12	10	10										
1990	5												
1991													
1992													
1993													
88-93:	17	10	10	1	12	0	0	0	0	0	0	1	12
1994													
1995													
1996													
1997													
1998													
1999													
2000													
94-00:	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 1: Live Cattle imports. Shading indicates period of different risk that UK-exports carried the agent, 1988-1993 being the period of highest risk.

Sources: CD = Country Dossier, EU = Eurostat, UK = Export data from UK.

According to the CD, all imported cattle were for breeding purposes (mainly bull calves, heifers and in-calf heifers) and were slaughtered at an average age of 10 years. No cattle were imported for immediate slaughter.

A detailed investigation was carried out on the 91 cattle imported from UK before 1987. It is stated by Kenya that none entered the feed chain, but no evidence was provided.

According to the Country Dossier, none of the imported cattle entered the animal feed-chain. At the end of their productive life, they were culled and sold for local slaughter for human consumption. None of their products were rendered and used as component in animal feeds. Deep pitting or incineration was used to dispose off the condemned carcasses and inedible offal.

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

Table 2 gives an overview of the MBM-imports into Kenya, as provided in the country dossier and compares it with the Eurostat and UK-export statistics.

According to the Country Dossier, "there was no import of MBM, BM (bone meal), MM (meat meal), greaves or feedstuffs containing the same from the UK or any other BSE affected country since 1980". As mentioned under point 2.1, legal Notice No. 326 from 2.12.1996 banned the importation of MBM, BM, MM.

Import of MBM, MM, BM or greaves (t/year) into <u>KENYA</u> from BSE-affected countries										
Period	UK			FR	BE	NL	IT	DK	Non-UK	
<i>Source:</i>	CD	EU	UK	EU	EU	EU	EU	EU	CD	EU
1980				500						500
1981				180						180
1982										
1983										
1984										
1985										
80-85	0	0	0	680	0	0	0	0	0	680
1986										
1987		80	80	198						198
1988				160	155					315
1989		342	* 342		317					317
1990		100	* 100							
86-90	0	522	522	358	472	0	0	0	0	830
1991										
1992										
1993							21			21
91-93	0	0	* 0	* 0	0	0	21	0	0	21
1994							42			42
1995								* 105		* 105
1996		381	** 381		90	100	20			210
1997		181	** 181							
1998		75	** 75		21					21
1999		138	** 138							
2000		120	** 120							
94-00:	0	896	** 895	* 0	111	100	62	* 105	0	378

Table 2: 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 1994-2000 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.

* Data confirmed in writing by the country authorities.

** Data confirmed in writing by UK authorities as being non mammalian MBM.

However, UK and EUROSTAT export data indicate that some MBM exports from BSE affected countries to Kenya were recorded (see Table 2 above) even after 1996. The registered exports totalled 1,418 tonnes from UK, of which 895 tonnes that were exported after 1996 are most probably poultry meal, and 1,909 tonnes from non-UK BSE affected countries.

The UK authorities confirmed export from UK to Kenya of 342 tonnes MBM in 1989, 100 tonnes in 1990 and also the exports after 1996 (non-mammalian meal).

On the other hand the customs and the veterinary authorities of Kenya confirmed that no records of MBM imports from BSE affected countries are registered, the only recorded imports being under the following categories:

- food wastes and prepared animal feed with a basis of molasses;
- food wastes and prepared animal feed NES".

Such a category ("Food Wastes") also exists in by Eurostat exports statistics as "Residues and Wastes from the Food Industry, Prepared Animal Fodder". They are different from MBM and other animal meals (registered as "Flours and Meals of Meat and Offals, Greaves") and contain many other components than MBM. This category is therefore not taken into account for the GBR assessment. It is worth noting that Eurostat records also indicate significant exports to Kenya in this category.

Also the Danish authorities confirmed export of 105 tonnes of MBM to Kenya in 1995 while the French authorities confirmed that from 1990 to 2000 no MBM was exported to Kenya.

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 external challenge resulting from live cattle imports has been low from 1980 until 1990 and negligible thereafter.

Kenya is denying the importation of MBM. The Veterinary authorities of the exporting countries, however, have confirmed the exportation of this item to Kenya. Therefore, this assessment is based on the Eurostat data. On the basis of Eurostat, the exports of MBM from BSE-affected countries, including the UK, to Kenya posed a moderate external challenge from in 1980/81. From 1982 to 1986 the level of external challenge due to MBM exports was negligible (no exports recorded) and high from 1987 to 1990, mainly due to imports from the UK. As exports from BSE-affected countries apparently stopped between 1991-1993 (cattle and MBM) the external challenge was negligible in that period. Because of exports from other BSE affected countries (BE/NL/DK), the level of external challenge became moderate between 1994-1999.

External Challenge experienced by Kenya				
<i>External challenge</i>		<i>Reasons for this external challenge</i>		
Period	Level	Cattle imports	MBM imports	Comment
1980 – 1981	Moderate	Low	Moderate	Eurostat data
1982 – 1986	Low		Negligible	
1987 – 1990	High		High	Eurostat data
1991 - 1993	Negligible	Negligible	Negligible	
1994 - 1999	Moderate		Moderate	Eurostat data

Table 3: 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.

On the basis of the available information the overall assessment of the external challenge is as given in Table 3 above. Kenya was exposed to a moderate overall external challenge between 1980-1981, a low overall external challenge for the period 1982-1986; and a high overall external challenge between 1987-1990 mainly due to imports of MBM from UK. Between 1991-1993 the overall external challenge was negligible. Since 1994, the overall external challenge has been moderate due to continuing exports of MBM from non-UK BSE affected countries.

3. STABILITY

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

Feeding:

Until 8/11/1999, when an official ban on the use of any MBM, MM, BM and greaves for the production of animal feedstuff was introduced, it was legal to feed animal protein to cattle.

It is unclear if any controls of feed took since 1999 when the MBM feed ban was adopted. Therefore, it cannot be excluded that imported MBM reached cattle prior and after the feed ban of 11/99.

Kenya has many feed manufacturing plants. It was indicated that Kenya is self-sufficient in proteins used for animal feed manufacturing, and did therefore not import MBM or MBM containing feeds. No detailed information was provided on feed production.

MBM was available in the country until 1992 when the only rendering plant of the country closed down. The plant supplied, according to the country dossier, adequate MBM, BM, MM and greaves to meet local requirements in the manufacture of animal feedstuffs. The Veterinary authority of Kenya states that before 1992 feedstuffs containing MBM, MM, BM and greaves were produced in the country from domestic raw materials and could possibly have been fed to some bovines in supplementary feed. It was not explained how the animal protein was replaced after the closing of the rendering plant.

In December 1996, MBM imports were banned and all feed manufacturers were advised not to use mammalian MBM in dairy feed but to replace it by fishmeal, which is abundantly available and not expensive, or proteins of plant origin (cotton seed cake, sunflower seed cake, etc.).

Rendering

The rendering process applied until 1992 was 133°C/20^{min}/3^{bar} and the plant was under veterinary supervision. However, no evidence for this was provided, as there were no records any more available due the date of closure of the plant. Bovine material, including SRM and animals dead at arrival, was rendered.

After 1992 there was, according to the Country Dossier no rendering industry in the country and no "sub-industrial scale" production of MBM existed.

SRM and fallen stock

There is no official SRM-ban in Kenya.

The Country Dossier states that SRM and animals dead during transportation or on arrival at the slaughterhouse were rendered until 1992 and it is understood that other fallen stock (dead on farm) were never rendered.

Since 1992, it is indicated that brain and spinal cord have been condemned (at meat inspection) and buried or incinerated under veterinary supervision. All other cattle SRM and offals (spleen and intestines included) are used as human food. None are rendered.

Condemned meat, carcasses and fallen animals are disposed off under veterinary authority supervision either through official condemnation pits available at all slaughterhouses or by burning, depending on the condition found during veterinary inspection.

Some fallen cattle are given to Kenya Wildlife Services (feeding of wild animals under veterinary supervision), in some areas they are sold to large dog kennels and in others these animals are fed to crocodiles in crocodile farms.

Cross-contamination:

There is no information as to whether measures were taken to avoid cross-contamination of farm animal feedstuff with MBM prior or after the feed ban of 11/99. It is therefore assumed, as a reasonable worst case scenario, that cross-contamination, i.e. involuntary inclusion of animal protein in cattle feed, occurred in addition to voluntary inclusion until the MBM ban of 1999. Cross-contamination seems possible also after the feed ban, as controls were not described and are assumed to be lacking. It therefore cannot be excluded that MBM ended-up in cattle feed. Before the closing of the rendering plant in 1992 it could have been imported and domestic MBM, thereafter only imported MBM could have been included into cattle feed.

Conclusion on the ability to avoid recycling

In light of the above-discussed information it has to be assumed that the BSE agent, should it have entered the territory of Kenya, would have been recycled and potentially amplified at until 1992. Since then the likelihood that the agent would have been recycled decreased significantly, mainly due to the closure of the rendering plant in 1992. However, until the ban on the use of MBM in the manufacturing of animal feed in 11/99 it cannot be excluded that imported MBM ended-up in cattle feed. After 1999 this became less likely but due to insufficient information on controls it cannot be excluded, still.

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

There has been no official livestock census since 1961. The estimates made by the authorities are as follows:

- between 3 and 3.2 million dairy animals,
- between 7 and 9 million beef animals.

The average age at slaughter of cattle in Kenya is said to be 4½ years for beef cattle and 10 years on average for dairy cattle.

In Kenya, according to the CD, 90% of the beef cattle are reared on pasture in ranches and pastoral areas and are never fed with manufactured feed (the figure was later corrected as corresponding to 98% of the total cattle population).

It is also indicated that the dairy cattle population in Kenya contributes to 8% to 9% of the total cattle population (in contradiction with the estimated figures above) and it is only a proportion of these that are given supplementary feed. Small-scale farms that contribute to 0.01% of the total livestock raise the dairy cattle population of Kenya. The average herd size for these dairy farms is of 1 to 2 cows per farm.

Surveillance and culling

BSE has been notifiable in Kenya as per legal Notice No 309, Kenya Gazette Supplement No. 62 since 1st November 1996. The Veterinary services have legal powers to take measures if BSE cases were confirmed since then.

Contradictory information on compensation was provided in different comments received from the Veterinary authorities:

- *“so far no policy is in place for compensation in the event of destruction of BSE infected animals” (CD of 28/12/00);*
- *”By the legal notice [of 1/11/96] it became compulsory [...] to report all BSE suspect cases to the DVS for actions. This include quarantines, slaughter and compensation” (CD comments of 12/01/01);*
- this was later contested by the Veterinary authorities (CD comments of 6/4/01).

It is concluded that no compensation is available if BSE cases were declared in Kenya.

No description is given of the criteria for a BSE-suspect.

There is apparently no personnel trained in BSE-diagnosis yet in Kenya.

According to the CD, there is an effective disease reporting system in place involving the official veterinary services, private practitioners, and the farming communities.

Awareness / training measures are in place and leaflets on BSE have been distributed. It is said that all veterinarians and para-veterinarians have participated in seminars/workshops on BSE.

According to the Country Dossier, heads of animals that have shown CNS-symptoms are sent to the Central Laboratory in Kabete for Rabies examination and any other differential diagnosis. The samples examined so far since 1991 (271 in total) were all rabies positive.

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
N° of samples	42	43	25	21	20	46	21	16	19	18	271

Table 4: Number of cattle with CNS symptoms examined.

There is no active surveillance of BSE.

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: Feeding MBM to cattle probably occurred until 1992 and was legally possible until November 1999. As the sole rendering plant of the country ceased its activity in 1992 since then the only MBM in the country could come from imports. There is no information on feed controls that could have avoided these imports reaching domestic cattle. Therefore feeding must be assumed to have been "not OK" before Nov 1999. Because of the feed ban introduced at that time it is assessed as "reasonably OK" since then but information on feed controls is lacking.

Rendering: Until 1992 ruminant material, including SRM and part of fallen stock was rendered in Kenya under process conditions that are regarded being adequate to reduce BSE. Rendering is therefore assessed as having been "reasonably OK" until 1992. After 1992 it is "OK" because it was totally stopped.

SRM-removal: There is no SRM ban and SRM were rendered until 1992. Therefore SRM removal was "not OK" before 1992. As no rendering has been carried out since 1992, SRM were completely removed from the feed chain. Therefore SRM removal is "OK" since then.

Other stability factors: There are and were no measures in place to control cross-contamination of cattle feed with MBM. The existing passive surveillance is not sufficient to detect BSE cases if they exist and no active surveillance is in place. Therefore the "other factors" reduce the stability of the system.

Stability of the BSE/cattle system in KENYA over time					
Stability		Reasons			
Period	Level	Feeding	Rendering	SRM	Other
1980 - 1991	Very unstable	Not OK	Reasonably OK	Not OK	
1992 - 1996	Stable		OK	OK	
1997 -1999					
2000- At current	Very stable	Reasonably OK			

Table 5: 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.

On the basis of the available information it has to be concluded that the country's BSE/cattle system was very unstable until 1992, stable between 1992-1999 and has been very stable since 2000. The stability of the system heavily depends on the absence of any form of rendering in the country that makes recycling of the BSE-agent via the feed chain virtually impossible.

4. CONCLUSION ON THE RESULTING RISKS

4.1 Interaction of stability and challenges

The conclusion on the stability of the BSE/cattle system of Kenya 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.

Kenya was exposed to a moderate external challenge between 1980-1981, a low external challenge for the period 1982-1986, and a high external challenge between 1987-1990. Between 1991-1993 the external challenge was negligible and since 1994, the external challenge has been moderate.

An external challenge resulting from cattle imports could only lead to an internal challenge once imported infected cattle were rendered for feed and this contaminated feed reached domestic cattle. Breeding cattle would normally live for 10 years or more. In the case of Kenya breeding cattle were imported between 1980-1990, mainly before 1986. If some of these animals were infected prior to import, before 1992, when the rendering plant was closed, they could have entered the Kenyan feed cycle only.

On the other hand imports of contaminated MBM, MM, BM or Greaves would lead to an internal challenge in the years of import, if fed to cattle. In the case of Kenya exports of MBM from BSE-affected countries, including the UK, to Kenya were registered in Eurostat, and confirmed by the exporting countries, in 1980/81, from 1987-91 and again from 1993 to 2000. It is unlikely, cannot be excluded that this MBM ended-up in cattle feed in Kenya and, if it was carrying the BSE-agent, domestic cattle got infected.

In view of the above-described analysis the recorded external challenges could have led to an internal challenge before 1992. Also after 1992 it is unlikely but cannot be excluded that imported MBM reached domestic cattle and lead to an internal challenge. However, as recycling of the agent became virtually impossible after rendering was stopped in the country, the internal challenge that might have existed in 1992 decreased at the rate with which the cattle infected before 1992 died and left the system. Hence the only source of a potentially still existing internal challenge are the MBM imports that occurred after 1992. Accordingly it is concluded that at present it is unlikely that an internal challenge exists but it cannot be excluded.

INTERACTION OF STABILITY AND EXTERNAL CHALLENGE IN <u>KENYA</u>			
Stability		External Challenge	Internal challenge
Period	Level	Level	
1980 – 1981	Very Unstable	Moderate	Likely present and growing
1982 – 1986		Low	
1987 – 1990		High	
1991			
1992 – 1993	Stable	Negligible	Likely present and decreasing* towards unlikely presence since 2000
1994 – 1999			
2000 – At current	Very stable	Moderate	

Table 6: 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. *rate of decrease somewhat reduced due to import of MBM with a certain risk to carry the BSE agent while feeding was still not sufficiently controlled making it possible that some imported MBM could have reached Kenyan cattle also after 1992.

4.2 Risk that BSE infectivity entered processing

It cannot be excluded that already in the 80s incubating live cattle or contaminated MBM was imported into Kenya. This imported MBM could have reached domestic Kenyan cattle. Infected domestic or imported cattle could therefore since the mid-80s have entered processing while being in the pre-clinical stages of the incubation. After 1992 this risk started to decrease because rendering stopped and new infections from domestic MBM became unlikely. It decreased with the rate at which cattle infected prior to 1992 left the system, i.e. since 1997 (5 years after rendering stopped) the processing risk is very low. It is not negligible because imported and potentially contaminated MBM could still have reached domestic cattle after 1992. After 1999 the risk of new infections resulting from MBM-imports decreased further, leading to a further decrease of the processing risk in the future.

4.3 Risk that BSE infectivity was recycled and propagated

If the BSE agent entered the system in the early 80s, incubating cattle (domestic or imported) were most likely processed since the mid 80s. At that time the infectivity harboured by these (pre-clinical) animals would have been rendered for feed and potentially recycled to domestic cattle, where it would have been amplified. In 1992 the rendering industry was closed down and the risk that the BSE-agent was recycled and propagated became very small.

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

As long as stability or external challenge remains constant, the probability of cattle to be pre-clinically or clinically infected with the BSE-agent will remain proportional to the external challenge resulting from MBM-imports and the efficiency by which it is prevented that imported MBM could reach domestic cattle.

5.3 Recommendations for influencing the future GBR

- Improving the stability of the system, in particular by avoiding any (imported) MBM being fed to cattle would, over time, reduce the GBR.
- Improving passive surveillance measures and initiating active surveillance, e.g. by systematic testing of adult cattle in fallen stock and emergency slaughter, would enhance the capacity to confirm absence of the disease from the territory of the country or at least to ensure that the incidence is below a certain statistical threshold.

