

Final report
on the updated assessment
of the
Geographical BSE-Risk
(GBR) of
ESTONIA - 2003

10 April 2003

NOTE TO THE READER

Independent experts have produced this report, applying an innovative methodology by a complex process to data that were 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 and its update of 11 January 2002. These opinions are available at the following Internet address:

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

This report, and the opinion of the SSC based on it, is now serving as the risk assessment required by the TSE-Regulation EU/999/2001 for the categorisation of countries with regard to their BSE-status. The final BSE-status categorisation depends also on other conditions as stipulated in annex II to that TSE-Regulation.

1. DATA

- The information available was sufficient to carry out a qualitative assessment of the GBR. However, the lack of most information concerning the period before 1991 adds to the remaining uncertainty. Reasonable worst case assumptions were used in cases where the available information was not adequate.

Sources of data

- Country dossier (CD) consisting of information provided from the country's authorities in 2000-2001.

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" (customs code 230110), covering the period 1980-2001.
- UK-export data (UK) on "live bovine animals" (1980-1996) and on "Mammalian Flours, Meals and Pellets", 1988-1996. As it was illegal to export mammalian meat meal, bone meal and MBM from UK since 27/03/1996, exports indicated after that date under customs code 230110 should only have included non-mammalian MBM.
- Export data from Cyprus, the Czech Republic, Hungary, Lithuania, Romania, Slovenia and Switzerland.

2. EXTERNAL CHALLENGES

Estonia became an independent country in 1991; prior to this date the country was part of the Soviet Union. Therefore, the Eurostat and other data for the Former Soviet Union are also presented for this assessment in order to indicate the overall context in that period.

2.1 Import of cattle from BSE-Risk¹ countries

Table 1 provides an overview of the data on live cattle imports, as provided in the country dossier (CD) and the corresponding data on relevant exports as available from BSE risk countries that exported to Estonia. Only data from risk periods are indicated, i.e. those periods when exports from a BSE risk country already represented, according to the SSC opinion on the GBR method of 2000 as updated in 2002, an external challenge.

- According to the CD, since its independence in 1991, Estonia imported 247 cattle from BSE-risk countries such as Denmark, the Netherlands, Finland and Germany.
- Eurostat and other data report higher figures (419 cattle) for cattle exports since 1991. This difference is mainly due to cattle exports from France (114) to Estonia reported by Eurostat but not confirmed by Estonia.
- According to the CD, no live cattle have been imported from the UK since the independence of Estonia in 1991, which is confirmed by Eurostat and other data.

¹ BSE-Risk countries are all countries already assessed as GBR III or IV or with at least one confirmed domestic BSE case.

- The CD reports the import of 242 live cattle from BSE risk countries other than the UK before Estonia's independence. They were imported from Denmark (167, approximation), the Netherlands (70, approximation) and Germany (5) between 1985 and 1989.
- Estonia indicated the import of 61 breeding cattle from the UK between 1985-1989. Detailed information is given on the fate of all 61 cattle (i.e. animal identity, year of birth, year of import, year of death and reason for death). All cattle died without having shown clinical BSE signs.
- All imported cattle remain "under supervision of official county veterinarians in their destination farms". However, the Estonian authorities estimate that 46 cattle imported from the UK might have entered the feed chain at an age older than 24 months.
- All imported cattle, which are still alive are specifically ear-marked and will be examined for BSE at the end of their production life.
- The Estonian authorities have carried out a detailed investigation on the fate of cattle imported (and of their offspring) from BSE risk countries since 1989. In total, 171 cattle (91 from NL, 41 from DK, 28 from FI and 11 from DE) were still alive in February 2002, or were slaughtered or died but have been tested negative for BSE. Consequently, these animals were not taken into account when calculating the external challenge.
- The Estonian authorities conclude that since 1989, 115 cattle imported from BSE risk countries (34 from UK, 19 from NL, 42 from DK, 5 from FI and 15 from DE) were slaughtered or died and were potentially rendered.
- The information on imports of cattle from BSE risk countries to the Estonian territory of the former Soviet Union before 1991 is difficult to obtain. According to Eurostat and other data, 66,374 cattle have been exported from EU member states to the former Soviet Union between 1980-1991. A reasonable worst case hypothesis is that a certain amount of these imports remained in the part of the former Soviet Union corresponding to the territory of Estonia.

Country:	Data	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	0	1	Total	
Denmark	CD						56*	55*	56*					2	35	2	1		1		41	1		250	
	other														35	2	1				41			79	
Finland	CD																4		2	1			22	4	33
	other																4		1	1			20	4	30
France	CD																								0
	other																114								114
Germany	CD										5				2	10							9		26
	other															10	35				1	9			55
Netherlands	CD						23**	23**	24**						1					34	75				180
	other																	32	34	75					141
UK	CD						7	10	5	5	34														61
	other																								0
ALL TOTALS																									
non UK	CD	0	0	0	0	0	79	78	80	0	5	0	0	2	38	12	5	0	37	76	50	23	4	489	
	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	35	12	154	32	35	77	50	20	4	419	
UK	CD	0	0	0	0	0	7	10	5	5	34	0	0	0	0	0	0	0	0	0	0	0	0	0	61
	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 1: Live cattle imports into Estonia (CD) and corresponding exports from BSE-Risk countries. Source for export data: Eurostat and UK export statistics and, where available, export statistics from other BSE-Risk countries. Note: Only imports in Risk periods (grey shaded) are taken into account for assessing the external challenge. Risk periods are defined according to the SSC opinion of 2000 as updated in 2002. *According to the CD, 442 cattle have been imported from Denmark between 1980-1987. The imports were equally distributed between the eight years and 167 cattle have been included in the risk period 1985-1987. **According to the CD, 187 cattle have been imported from the Netherlands in the period 1980-1987. The imports were equally distributed between the eight years and 70 cattle have been included in the risk period 1985-1987.

2.2 Import of MBM² or MBM-containing feedstuffs from BSE-Risk countries

- According to the CD and to Eurostat and other data no MBM has been imported by or exported to the Estonian territory or to the Soviet Union before Estonia's independence.
- According to the CD, Estonia imported 5,012 tons of MBM from BSE risk countries other than the UK between 1993 and 2001. Most of the MBM originated from Denmark (4,380 tons) and Finland (552 tons). No annual breakdown for the imports was given. It was stated in the CD that all imported MBM was used for the production of pig and poultry feed. However, no evidence was provided for this statement.
- Eurostat and other data report similar figures (5,474 tons) for the period 1993-2001.
- According to the CD, 15 tons of MBM imported from the UK in 1994 were used for the production of pig and poultry feed, but no evidence was provided. This amount is not confirmed by revised UK export data.
- In addition Estonia informed that between 1980-2000, it imported 41,203 tons of feeding stuffs from Belgium/Luxembourg, Denmark, France, the Netherlands and the UK. It is assumed that they contained a certain percentage of MBM, as well. As the amount of MBM in these feeding stuffs cannot be estimated, feeding stuffs are not taken into further consideration albeit it points to an additional risk that the BSE-agent might have been imported.

² For the purpose of the GBR assessment the abbreviation "MBM" refers to rendering products, in particular the commodities Meat and Bone Meal as such; Meat Meal; Bone Meal; and Greaves. With regard to imports it refers to the customs code 230110 "flours, meals and pellets, made from meat or offal, not fit for human consumption; greaves".

Country:	Data	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	0	1	Total
Belgium	CD																2							2
	other																2			35	21	995		1053
Denmark	CD																161	603*	425	278	1287	1626		4380
	other																54	495	294	162	1156	1493	72	3726
Finland	CD																137	94	159	116		46		552
	other																137	94	159	92		46	23	551
France	CD																							0
	other																	20						20
Germany	CD																							0
	other															1	7	3	1	1				13
Netherlands	CD														16		8	51		3				78
	other														19	30	8	51		3				111
UK	CD															15								15
	other																							0
TOTALS																								
non UK	CD	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	308	748	584	397	1287	1672	0	5012
	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	19	31	208	663	454	293	1177	2534	95	5474
UK	CD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	15
	other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2: MBM imports into Estonia (CD) and corresponding exports from BSE-Risk countries. Source for export data: Eurostat and UK export statistics and, where available, export statistics from other BSE-Risk countries. Note: Only imports in Risk periods (grey shaded) are taken into account for assessing the external challenge. Risk periods are defined according to the SSC opinion of 2000 as updated in 2002. As according to Eurostat and other data no MBM was exported to the Former Soviet Union between 1980 and 1991 and due to the fact that the total amount of MBM imported according to the CD (5,012 tons) and according to Eurostat and other data (5,474 tons) largely correspond, it is assumed, that Eurostat and other data are correct. The country data were distributed along with Eurostat data.

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 (as updated in January 2002).

- Live cattle imports:

The country imported over the period 1980 to 2001 a total of 489 live cattle (CD data) from BSE-risk countries, of which 61 were imported from the UK (CD). Eurostat however does not report live cattle exports from UK to Estonia for this period but to the Soviet Union. Broken down to 5-years periods the resulting external challenge is as given in table 3. This assessment takes into account the different aspects discussed above that allow to assume that certain imported cattle did not enter the domestic BSE/cattle system, i.e. were not rendered into feed.

- MBM imports:

In total the country imported over the period 1993-2001 5,474 tons MBM (Eurostat and other data) from BSE-risk countries, of which none (Eurostat and other data) came from the UK. According to the CD, 15 tons of MBM were imported from the UK. Broken down to 5-years periods the resulting external challenge is as given in table 3.

External Challenge experienced by ESTONIA				
<i>External challenge</i>		<i>Reason for this external challenge</i>		
Period	Overall Level	Cattle imports	MBM imports	Comment
1980 – 1990	Significant*	Moderate**	Negligible	
1991 - 1995	Moderate	Negligible	Moderate	
1996 - 2000	High		High	

Table 3: External Challenge resulting from live cattle and/or MBM imports from the UK and other BSE-Risk countries. The Challenge level is determined according to the SSC-opinion on the GBR of July 2000 (as updated in January 2002). *Significant because it is assumed that some external challenge was experienced also before the independence of Estonia. **Based on data provided by Estonia.

On the basis of the available information, the overall assessment of the external challenge is as given in the table above.

Only limited data were available for the period before 1991 and a reasonable worst case assumption was made that it is likely that the BSE-agent entered the country's territory already at that time.

Obviously, the imports of MBM, mainly from Denmark, Finland and Belgium have created the moderate to high external challenge since 1991. This challenge is underlined by the much higher imports of feedingstuffs which most probably also contained certain amounts of MBM.

3. STABILITY

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

Feeding

- Sixteen feedmills are producing feed for farmed animals of which 12 feedmills produce both ruminant feed and feed for monogastric animals. 6 out of these 12 feedmills use MBM for the production of monogastric feed. In 2000, more than 125,000 tons of compound feed was produced of which about 23,000 tons were destined to ruminants.
- Feeding of dairy cows is based on silage and barley (preserved using ammonia) and for high yielding cows (above a daily milk yield of 15 kg) complementary feed is added (composed of barley, oats and peas).

Feed bans

- According to the CD, a MBM to ruminants ban exists in Estonia since February 2001.
- The feeding of MBM derived from mammalian low risk material to non-ruminant farmed animals is still allowed. From July 2003 this ban will be extended to all farmed animals kept for the production of food.
- Since July 2002, the feeding of MBM from high risk animal waste and from Specified Risk Material to farmed animals kept for the production of food is forbidden. MBM from high risk animal waste can still be fed to fur animals.
- From July 2003, the use of fishmeal, dicalcium phosphate and hydrolysed proteins for the feeding of ruminants will be prohibited.

Use of MBM in cattle feed

- According to the CD, there has “never been a tradition to use MBM, BM, MM and greaves in commercial feedstuffs intended for cattle and sheep, but for pigs and poultry feed”. The CD further states that MBM is not used for the production of calf feed.
- It is explained that the milk price is low (maximum 0,15 EUR per litre), and the average milk yield is also low and that there is a strong price disincentive between the price of corn and the price of feeding stuffs containing animal proteins. The compound feed for replacement stock is described as being produced by the farmer, using domestically produced grain mixed with supplementary feeding stuffs bought at feed mills (mostly plant proteins and vitamin/mineral premixes). It is also indicated that protein sources are oil cakes and other products of the oil industry (sunflower cake and soybean cake).
- It is assumed that feeding cattle with MBM was possible before February 2001 and that no active measures were in place to ensure non-feeding.

Potential for cross-contamination and measures taken against

- Since July 2002, MBM containing feed has to be labelled with the warning: “not to be fed to ruminants” and ruminant feed has to be transported and stored separately from other feed.

- Since July 2002, a regulation on “requirements for transport of feeding stuffs” is in force. According to this regulation, animal proteins which are not allowed to be fed to ruminants may only be transported from the producer i.e. a rendering plant or from the state border only directly to a feed mill. This precludes any direct access for farmers to MBM.
- From July 2003, transport vehicles used for the transport of bulk feed containing MBM may not be used to transport feed for ruminants.
- From July 2003, specific requirements for feedmills manufacturing compound feeding stuffs containing animal protein will come into force. In multi-species feed mills the use of MBM for non-ruminant feed will be only allowed, if cross-contamination of ruminant feed can be precluded i.e. totally separated production lines will become mandatory.
- No information on cross-contamination was provided by the CD. No specific control measures are reported.
- Imported MBM is used in Estonian feed mills under the inspection of the Plant Production Inspectorate.
- Feedmills are visited quarterly and the activities of the importers are controlled twice a year by inspectors.
- On-farm inspections by authorised veterinarians take place at least once a year on individual farms (4 times/year for dairy farms), where feed and additives used on the farm are registered. There are also extended feed control inspections targeted at the 15 biggest farms in Estonia.

Control of Feed bans and cross-contamination

- Feed samples have been analysed in 2001 and 2002 either by a Danish laboratory using microscopy or by an Estonian laboratory using a PCR method. No information on the detection limit of the PCR method used was provided. However, according to the knowledge of the EU scientists, the PCR method is only designed to give a qualitative result and only works if the MBM has not been processed using too severe conditions. According to the CD a sample is negative, if no MBM is found.
- Since 2003, the microscopic method is established in the Estonian Veterinary and Food Laboratory. According to the CD the detection limit for this method is 0,5 %.
- In 2001 (until November), 40 feed samples have been taken from domestically produced and imported ruminant feed. Around 25 % of the samples taken tested positive for MBM, whereas the number of positive samples in imported feed was higher than in domestically produced ruminant feed.
- Data were provided on feed ban controls carried out in 2002 until the end of November: 72 bovine feed samples from different feed mills (domestic production) have been examined. Four samples have been found positive (2 samples with less than 0,5% MBM in compound feed, and 2 samples with less than 0,1 %).
- According to the CD, during veterinary control visits to cattle farms also feed controls are carried out. It is stated that if the suspicion arises that animal proteins are fed to ruminants, feed samples would be taken for laboratory analysis.

Rendering

- There are three main rendering plants in Estonia, handling all kinds of animal waste including waste of ruminant origin (low risk material, high risk material, SRM) until November 2000. In 2000, the rendering plants produced 2,701 tons of MBM and 689 tons of tallow from ruminant origin.
- According to the CD, the three rendering plants operate the 133°C, 3^{bar}, 20^{min} standard.
- Since November 2000, high risk material animal waste is buried in approved burial sites.
- Since January 2002, SRM (excluding the vertebral column) is also exclusively buried in official burial sites.
- Since January 2002, the three rendering plants process only low risk animal waste.
- A new rendering and incineration plant designated for the processing of high risk material and SRM is currently being built and will be operational from the end of 2003.
- Decree N° 65 of November 2000 provides new requirements on collection, transportation and handling of animal waste. All high risk material and low risk material from mammals (with the exemption of technical use, pet food and fur animal feed) has to be processed at 133°C/20^{min}/3^{bar}. It remains unclear, if and since when the rendering plants meet the required standards.
- According to available information, at least two of the mentioned rendering plants had problems in the recent past to ensure that the required parameters (133°C/3^{bar}/20^{min}) are achieved.
- According to the CD, the Veterinary and Food Board inspects every rendering plant every 3 months at least. The burial places are inspected every 6 months at least.
- The annual production of two of the three rendering plants:

year	raw material intake (t)	MBM (t)	tallow (t)
2000	5.922	1.674	720
2001	6.182	1.770	774
2002	5.982	1.710	720

Table 4: yearly production of MBM and tallow of two of the three Estonian rendering plants

- The MBM is sold to feed mills and was in the past sold to a certain extent directly to farmers for the production of pig, poultry and fur animal feed.
- The MBM (about 120 tons per year) from the third rendering plant is used for the production of petfood.

SRM and fallen stock

- According to the CD, a SRM ban does exist since June 2001 and is covering the full list of tissues (vertebral column included) since January 2003. Since January 2002, all SRM is buried.

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 Estonia would have been recycled and amplified.

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 CD, in 2000 the Estonian cattle herd consisted of 267,300 cattle of all ages. 138,400 were dairy cows and were slaughtered at an average age of 5 years. Male cattle for fattening are normally slaughtered at 2 years of age.
- Due to the Fresh Milk Hygiene requirements it is not allowed to rear cattle and non-ruminants at the same time (no co-farming for the purpose of this assessment). This regulation has been enforced since November 1999 (regulation of 21/10/99). Farms have on average less than 5 cows. It is assumed that these small farms also keep other species.
- The annual average milk yield was 5.490 kg/year in 2001 and 5.610 kg/year in 2002.

BSE surveillance

- Notification of BSE has been compulsory since 22 October 1990 and the symptoms of BSE-cases or suspects are described in detail.
- According to the country dossier, awareness-training measures have been in place since 1990, and also the laboratory staff has been trained since 1994. An ongoing training program (“post mortem inspection and sampling for TSE”) has been established. In February 2001, training on sampling methods was organised for meat inspectors and animal health inspectors.

Passive surveillance

- A detailed investigation carried out on cattle imported since 1989, according to the CD, revealed that no imported cattle or their offspring were reported dead or slaughtered with nervous symptoms. Only a low number of BSE-suspects were examined in the last 10 years (2 in 2001, 7 in 2002). Also the number of cattle with central nervous symptoms that were analysed annually for BSE are below the OIE requirements.
- The total number of animals examined for BSE (all bovine animals over 3 years of age, which have died or were slaughtered having shown nervous symptoms) was 3 in 2000 and 20 in 2001.

Active surveillance

- Since the beginning of 2001, a so-called active surveillance programme was set up in Estonia. The aim is to examine all bovines that died or were slaughtered, having shown nervous symptoms and in addition to sample randomly 950 cattle over three years of age (597 samples examined in 2001). The intention was to focus on cattle

for emergency slaughter or sick at normal slaughter (122 samples examined) and fallen stock (69 samples examined). Also all bovines imported from BSE risk countries have to be sampled after their reproductive life. All bovines have been tested negative.

- However, it is obvious that the number of fallen stock tested is low. This might be due to the missing obligation to notify fallen stock.
- According to the CD, since January 2002 all fallen bovines older than 24 months of age have to be notified to the veterinary service and are tested for BSE.
- In 2002, a total of 1.726 cattle have been examined for BSE. 38 samples came from imported cattle, 760 from emergency slaughtered/sick slaughtered cattle, 913 from fallen stock and 15 from healthy slaughtered cattle. All results were negative for BSE.
- According to the CD, it is planned from the second half of 2003 to test all healthy slaughtered cattle over 30 months of age, all sick and emergency slaughtered cattle older than 24 months of age, all fallen bovines older than 24 months of age and all “risk group animals” (cattle imported from BSE risk countries).

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 removal) and of the additional stability factor, surveillance 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 was legally possible until February 2001, even though the information provided indicates that it was uncommon practice for dairy and beef cattle. Because there is no evidence provided that MBM was not fed to cattle, and in view of the late introduction of a MBM to ruminant feed ban (only in 2001), it is assumed that feeding was **"not OK"** from 1980-2000. Since 2001, feeding is regarded as **“reasonably OK”**.

Rendering

Rendering is and was common practice in Estonia. The rendered material contains ruminant material, and until the end of 2001 also SRM and fallen stock. The processes used before November 2000 were not adequate for reducing BSE-infectivity. It remains unclear, if, when and where the 133°C/20^{min}/3^{bar} standard has been applied since then. Therefore, rendering is regarded as **“not OK”** for the entire period 1980-2001.

SRM-removal

There was no SRM ban until the middle of 2001, SRM was included in the raw materials rendered and fallen stock might have been rendered, too. Therefore, SRM removal was **“not OK”** for the entire period 1980-2001. Since 2003, SRM removal is considered **“reasonably OK”** because the list of tissues and organs is now complete and could be considered **“OK”** if evidence is provided that it is well implemented.

BSE surveillance

Although an “active surveillance” programme was initiated in 2001, the low number of fallen stock examined indicates that the system is not working sufficiently. This therefore cannot improve the stability of the system throughout the entire period.

Stability of the BSE/cattle system in ESTONIA over time					
Stability		Reasons			
Period	Level	Feeding	Rendering	SRM removal	BSE surveillance
1980 – 2000	Extremely unstable	Not OK	Not OK	Not OK	↓
2001 – 2002	Very unstable	Reasonably OK			
2003 –	Unstable			Reasonably OK	

Table 5: Stability resulting from the interaction of the three main stability factors and the BSE surveillance. 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 extremely unstable from 1980 to 2000 and is very unstable since 2001.

4. CONCLUSION ON THE RESULTING RISKS

4.1 Interaction of stability and challenges

In conclusion, the stability of the Estonian BSE/cattle system in the past and the external challenges the system has coped 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 had to be met by the system, in addition to external challenges that occurred.

INTERACTION OF STABILITY AND EXTERNAL CHALLENGE IN ESTONIA			
Period	Stability	External Challenge	Internal challenge
1980 - 1990	Extremely unstable	Significant*	Likely to be present and growing
1991 - 1995		Moderate	
1996 - 2000		High	
2001- 2002	Very unstable		
2003-	Unstable		

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. *Significant because it is assumed that some external challenge was experienced also before the independence of Estonia.

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. Cattle imported for slaughter would normally be

slaughtered at an age too young to harbour plenty of BSE infectivity or to show signs, even if infected prior to import. Breeding cattle, however, would normally live much longer and only animals having problems would be slaughtered younger. If being 4-6 years old when slaughtered, they could suffer from early signs of BSE, approaching the end of the BSE-incubation period. In that case, they would harbour, while being pre-clinical, as much infectivity as a clinical BSE case. Hence cattle imports could have led to an internal challenge about 3 years after the import of breeding cattle (that are normally imported at 20-24 months of age) that could have been infected prior to import.

In the case of Estonia this implies that imports of potentially contaminated cattle from the Denmark, the Netherlands and the UK and Germany (CD data) even in the period prior to the independence of Estonia (starting from 1985) posed a significant external challenge. Further, it has also to be taken into account that the BSE/cattle system of the former Soviet Union (and therefore also the territory of Estonia) was exposed to a significant external challenge from 1980-1991. Therefore, cattle imports into the territory of Estonia could have led to an internal challenge from the second half of the 1980s onwards due to cattle imports in the early 80s.

On the other hand imports of contaminated MBM would lead to an internal challenge in the year of import, if fed to cattle. The feeding system is of utmost importance in this context. If it could be excluded that imported, potentially contaminated feed stuffs reached cattle, such imports might not lead to an internal challenge at all.

In the case of Estonia this implies, on the basis of Eurostat and other data that imports of potentially contaminated MBM from Denmark, Belgium, Finland and the Netherlands could have led to an internal challenge from 1995 onwards.

In view of the above-described reflection the combination of significant external challenges with an extremely unstable system until 2000 makes the occurrence of an internal challenge likely since 1995 but most probably already earlier, as cattle imports from Denmark, the Netherlands, the UK and Germany could have led to an internal challenge in the territory of Estonia from the second half of the 1980s onwards. This internal challenge met an extremely unstable system and was recycled and amplified, also due to high amounts of imports of potentially contaminated MBM, and was growing over time. The continuing external challenges supported this development.

4.2 Risk that BSE infectivity entered processing

- Given the fact that the BSE-agent was probably imported in non-negligible quantities into the country by cattle and MBM-imports, a risk that BSE infectivity entered processing first existed about 3 years after cattle imports and 5 years after the first import of potentially contaminated feed stuff. This could have been as early as 1988 due to cattle imports.
- Given the instability of the system, this risk increased over time.

4.3 Risk that BSE infectivity was recycled and propagated

- A risk that BSE-infectivity was recycled and amplified first existed since potentially infected domestic cattle were processed, i.e. in the second half of the 80s.
- Given the instability of the system, this risk increased over time.

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 *III*, *i.e. it is likely but not confirmed* 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 the stability remains as it is, the probability of cattle to be (pre-clinically or clinically) infected with the BSE-agent will continue to increase, even if further external challenges would be avoided.
- Any further external challenge will increase the risk that, over time, a BSE epidemic develops in the country.

5.3 Recommendations for influencing the future GBR

- Improving the stability of the system would make it less vulnerable to external challenges and could lead, over time, to a reduction of the GBR. Excluding SRM from entering the feed cycle and implementing efficient feed ban controls would be particularly important. Verifying the correct application of the feed ban could ensure that the risk reduction potential of this part of the feed chain is optimally exploited.
- A better active surveillance would allow monitoring the development of the GBR and to verify the efficiency of future stability enhancing measures.