

FINAL REPORT ON THE ASSESSMENT OF THE GEOGRAPHICAL BSE RISK OF GREECE

5 December 2002

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, are 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 available information was sufficient to carry out the qualitative assessment of the GBR.

Sources of data

Country dossier consisting of:

- Country dossier (CD) consisting of information provided by the country's authorities in 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, Estonia, Hungary, Lithuania, Romania, Slovenia and Switzerland.
- Final reports of missions of the FVO carried out in Greece from 14 – 18 December 1998, from 12-16 February 2001 and from 17 – 21 September 2001 in order to evaluate the application of control measures to protect against BSE.

2. EXTERNAL CHALLENGES

2.1 **Import of cattle from BSE affected countries**

Table 1, below, provides an overview of the data on live cattle imports, as provided in the CD and the corresponding data on relevant exports as available from BSE risk countries that exported to Greece. 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 January 2002, an external challenge.

The CD only provides data on cattle imports from 1985 onwards. It shows imports of live cattle from the UK. Eurostat and UK export data report 3 and 2 breeding cattle exported from UK to Greece in 1982 and 1984, respectively.

The CD indicates that between 1985 and 2000 approximately one million bovine animals were imported from BSE-risk countries¹ other than UK. It is stated that about 85% of these cattle were calves for fattening and slaughter at an age between 16 and 20 months of age. This percentage seems reasonable if it is compared to the total bovine population of Greece. The external challenge was therefore calculated on the basis of 15 % of the imported cattle.

¹ The term "BSE risk countries" refers to all countries already assessed as GBR III or IV or having notified at least one domestic BSE case.

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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
Austria	CD																		251		177			428
	other																	3	151		241	20		415
Belgium	CD						82									26		35			38	185		366
	other							86			61		43	32	222	26	1	1			39	118		629
Cyprus	CD																							
	other																		4171					4171
Czech Rep.	CD										676	1477	10326	15167	9511	7198	6614	8516	4344	4989	4533			73351
	other												10338	7005	6669	6728	8850	4309	5000	4473	7828			61200
Denmark	CD						103	371	446	200	714	241	214	1045		170	175	95	243	486	173	481		5157
	other						103	372	446	246	714	242	214	1107	1342	170	449	684	258	380	648	553		7928
France	CD						23755	3794	234	521	933	1081	169	294		4849	7630	24522	19414	16337	12823	17872		134228
	other		4425	1914	3621	13029	24510	3652	304	569	970	1174	571	936	6176	8511	9939	33958	24043	18947	26488	18098		201835
Germany	CD						1475	523	1717	2850	3214	2459	2703	3473		293	232	716	1919	1112	1724	5122		29532
	other		3254	945	107	171	471	202	294	973	1275	1028	2881	4092	1331	656	428	1091	1948	2754	3450	4512		31863
Hungary	CD						6257	8324	9546	4842	6927	7466	10914	19767	7324	3992	4835	6544	9206	8308	6677	7855		128784
	other														8221	3913	4088	6882	7947	8183	6854	8575		54663
Ireland	CD																		142	247	491	154		1034
	other				94														52					146
Italy	CD						300	130			76		31	2119					200	1078	593	715		5242
	other				600	2343	1835	130			59		31	3064	1725	3176	1674	1757	1943	1596	1894	1075		22902
Luxembourg	CD																			34				34
	other																							0
Netherlands	CD						595	315	672	1036	991	337	380	355		785	857	332	2442	3353	1387	2949		16786
	other						608	367	649	942	973	283	340	966	451	784	890	705	3096	2586	2372	989		17001
Poland	CD						5656	4382	2707	5047	3353	6100	5284	2716	462	329	1526	0	1490	11956	5918	4707		61633
	other																							0
Portugal	CD															13								13
	other																							0
Romania	CD						78							961	651	10764	11075	10083	22100	18676	37415	37229		149032
	other														356	4860	11072	10211	21730		19944	14116	651	83914
Slovak Rep.	CD														5322	1618	2214	2086	2916	1331	1180	363		17030
	other																							0
Slovenia	CD						27617	37441	55753	48749	57606	55448	49602	17125	145									349486
	other			157	199	418	457	1558	10348	1915	4705	2669	2356	805										25587
Spain	CD																8	3190	2499	1231	801	776		8505
	other														110		2102	2077	1319	2072	1625		9305	
UK	CD																							
Totals	other			3		2																		
Non-UK	CD	0	0	0	0	0	65840	55358	71075	63245	73814	73808	70774	58181	29071	32350	35750	54217	71338	68493	74386	82941	0	980641
	other	0	7679	3016	4621	15961	27984	6367	12041	4645	8757	5396	6436	11976	30162	29211	35210	64122	76266	40074	69002	54154	8479	521559
UK	CD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	other	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5

Table 1: Live cattle imports into Greece (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 January 2002.

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

The CD only provides data on MBM imports from 1985 onwards. It indicates that 198 tons of MBM have been imported from the UK in 1986 and 1987. Eurostat registered no UK-exports at that time. However, according to Eurostat, 3,138 tons have been exported from the UK to Greece since 1994. Of this amount, 2,974 tons have been exported after 1996, i.e. after the export ban for bovine products from the UK. It has to be assumed that these exports represented non-mammalian MBM and are therefore not taken into account.

The CD also lists approximately 167,000 tons of MBM imports from other BSE-risk countries, in particular from France, Italy and Denmark, between 1985 and 2000.

Eurostat recorded more than 276,000 tons of MBM exports from non-UK BSE-risk countries to Greece for the period 1980-2000. The majority of these imports came from France, followed by Italy and Denmark.

In addition, the CD shows imports of more than 1,800 tons of blood-meal, 12,800 tons of MBM mixtures, and more than 3,600 tons of greaves from BSE risk countries between 1985 and 2000. As no information is provided on the composition of "MBM mixtures" it is assumed that they contained at least 50 % MBM and the relevant amount of MBM is taken into account for the calculation of the external challenge.

The CD explains that MBM imports from third countries are inspected at the border inspection posts. These inspections include microbiological and chemical analysis but apparently no verification of the process conditions applied or the origin of the raw material. Since January 2001, fishmeal imports are checked for absence of mammalian MBM. Of 159 batches tested microscopically, in 3 batches MBM contamination was found and the batches were destroyed.

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"

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COUNTRY: GREECE																								
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						243	272	569	295	1106	321	279	20					81	135				3.321
	other				140	120	320	420	882	180	1624	564	60	65		451	612			19				5.457
Cyprus	CD												180	307	489	603	240	280	58					2.157
	other																							0
Denmark	CD							45	449		65	319	668	656					486	942	6605	37777		48.012
	other								1		153	406	647	1058	2243	2689	2405	3648	9369	9345	7831	8097		47.892
France	CD						9523	8660	7370	3987	3337	5820	4453	3490										46.640
	other		13201	11700	10543	8587	9280	7623	7148	4002	4239	6060	4198	5081	4094	4304	3473	4138	3181	3626	2895	2078		119.451
Germany	CD						44				542	203										43		832
	other											2	2		29	42	107	106		803				1.091
Hungary	CD																				10			10
	other																							0
Ireland	CD									40														40
	other				94																			94
Italy	CD						5874	5760	6270	6146	6074	20956	5101	3486						428	3157	86		63.338
	other				1847	4525	7066	5407	6776	6769	6800	3413	4615	5015	7654	6201	6298	3124	2305	5420	5220	4152		92.607
Netherlands	CD						284	982		100	0	57	168	129										1.720
	other						314	866	2	1167	37	22		346	90	530	677	722	208	680	1013	1013		7.687
Spain	CD						200	309	184	60	41													794
	other						220	300	180	100	180				955				18					1.953
UK	CD							3	195															198
	other															101	63			405	1846	723		3.138
TOTALS																								
non UK	CD	0	0	0	0	0	16168	16028	14842	10628	11165	27676	10849	8088	489	603	240	280	625	1505	9815	37863	0	166.864
	Euro	0	13201	11700	12624	13232	17200	14616	14989	12218	13033	10467	9522	12520	14110	14217	13572	11738	15081	19893	16959	15340	0	276.232
UK	CD	0	0	0	0	0	0	3	195	0	0	0	0	0	0	0	0	0	0	0	0	0	0	198
	Euro	0	0	0	0	0	0	0	0					0		101	63			405	1846	723	0	3138

Table 2: MBM imports into Greece (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 January 2002.

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 on 11 January 2002.

- Live cattle imports:

In total the country imported over the period 1980 to 2001 980,646 live cattle (CD) from BSE-risk countries, of which 5 came from the UK (Eurostat and other data). 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 enter the domestic BSE/cattle system, i.e. were not rendered into feed or did enter but were too young to create a risk.

- MBM imports:

In total the country imported over the period 1980-2000 279,370 tons MBM (Eurostat and other data) from BSE-risk countries, of which 3,138 tons came from the UK (Eurostat and other data). 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 MBM did not enter the domestic BSE/cattle system or did not represent an external challenge for other reasons.

External Challenge experienced by <u>GREECE</u>				
<i>External challenge</i>		<i>Reason for this external challenge</i>		
Period	Level	Cattle imports	MBM imports	Comment
1980-1990	Very high	Moderate	Very high	
1991- 1995				
1996-2000	Extremely high	High	Extremely high	

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 as amended in January 2002.

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

3. STABILITY

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

Feeding:

Commission Decision 94/381/EC (feed ban) was notified by circular letter No. 427768 on 19 December 1994. Ministerial Decision 294292 of 21 January 1998 transposed Commission Directive 97/47/EC (labelling of non-ruminant feed containing MBM) and Commission Decision 97/582/EC (list of prohibited ingredients in ruminant feed). Council Decision 2000/766/EC (total ban) was transposed by circular letter 333402 of 3 January 2001. Further EU legislation (Commission Decisions 2001/9/EC and 2001/165/EC) on specific Processed Animal Proteins (i.e. fish meal etc.) have not been transposed to Greek legislation.

According to the latest FVO report (mission in Greece, September 2001), 40 commercial feed mills exist in Greece of which only two produce feed for ruminants and non-ruminants. More than 80 % of the farms produce their own feed (home compounders). However, these home compounders are not included in the feed controls to check absence of MBM in ruminant feed.

Data on the yearly production and the yearly use of MBM of commercial feed mills are not available.

According to the CD MBM has never been "recommended or actually and consciously" used as feed for bovines, and MBM was and is exclusively used for feeding pigs, poultry and fish. Ruminant feed is said to be solely of vegetable origin. It was, however, not forbidden to feed ruminants with MBM until 1994 when the European ban of feeding mammalian MBM to ruminants was implemented. However, these statements are not supported by any additional information like higher prices for MBM as compared to soy bean etc. Therefore, it has to be assumed that a certain amount of MBM was traditionally fed also to cattle. In contrast to the statement that MBM was never used for ruminants, according to the FVO report, one of the two commercial feedmills visited in September 2001 declared that it ceased using MBM in ruminant feed on a voluntary basis in 1996.

According to the CD, the EU-feed ban was notified to the industry and inspection services by circular letter, but obviously not included in the national legislation. It is not clear from the available information to which degree the feed ban was enforced in Greece. Ad-hoc checks have been carried out since that time, and in total 255 official feed samples have been taken in 2001. However, the majority of these samples were taken by border inspection posts mainly from imported fish meal consignments (142). Only 37 ruminant feed samples were taken (all with negative results). Also in earlier years the number of samples taken to be checked for the absence of MBM in ruminant feed was low (71 in 1998; 27 in 1999; 64 in 2000). So far it seems that in Greece MBM was never detected in a ruminant feed sample. These results are in clear contradiction to the findings in most other member states. Furthermore, it is anticipated to expect some of these tests to be positive strictly due to the imperfect specificity of the system. Whether the total

feed ban for all farm animals is implemented in Greece is not mentioned in the CD. According to the FVO report of February 2001, the animal feed controls carried out in 1999 and 2000 were not sufficient. It is especially pointed out in that report that the large numbers of farms producing its own feed have been excluded from the feed controls. These farms produce 34 % of the total feed production in Greece (FVO report, September 2001).

The report on the FVO mission of September 2001 concludes that the controls of the feed ban are still not satisfactory and the inspection system is not verifiable. The possibility of cross-contamination along the feed production chain as well as the direct use of Processed Animal Proteins (this covers also MBM) cannot be excluded.

Cross-contamination:

Due to the insufficient sampling activities and the high number of on farm mixers (co-farming of different species is assumed), which seem not to be controlled in this respect at all, it has to be assumed that cross-contamination of ruminant feed with MBM from feed to monogastric animals has been frequent and widespread all over Greece.

Rendering³:

Nineteen rendering plants exist in Greece. Nine of them are processing mammalian waste, six poultry waste and four are processing specifically animal waste producing mainly fat not intended for human consumption. These rendering plants are approved by on-the-spot-inspection by the Veterinary Service. Some of the rendering plants belong to integrated systems producing pigs / pig meat or poultry / poultry products. These rendering plants only use either pig or poultry offal only and the MBM was used only for feed production within the respective integrated system.

No data are provided on the amount of MBM produced annually.

According to the CD, before 1996 the rendering process conditions were below the $133^{\circ}\text{C}/20^{\text{min}}/3^{\text{bar}}$ standard. In 1996-1997, all rendering plants gradually adopted the standard of $133^{\circ}\text{C}/20^{\text{min}}/3^{\text{bar}}$ to all mammalian waste. From late 1997 onwards all rendering-plants that processed mammalian waste operated at $133^{\circ}\text{C}/20^{\text{min}}/3^{\text{bar}}$. According to the FVO report on a mission in December 1998 the latter statement has to be questioned, because the three rendering plants visited did not fulfil the processing conditions as described above. It was also concluded that the inspections carried out by the veterinary service were not satisfactory.

From the CD, it is not clear if also rendering plants processing only bones were operating $133^{\circ}\text{C}/20^{\text{min}}/3^{\text{bar}}$, but it is assumed that bones are not processed according to the required standard.

³ For the purpose of the GBR-assessment “rendering” refers to all processes that transform animal material into a product that is or can be used in animal feed, particular all products covered by the term “MBM”, previously defined.

SRM and fallen stock

According to the CD, fallen stock did never enter the rendering plants because “high risk” wastes (all by products of animal origin, which are not fit for human consumption) have always been destroyed by burial in landfills or on farm.

SRM was included in the raw material of the rendering plants, whenever an animal was subjected to ante and post mortem and found to be fit for human consumption.

An SRM ban is existing since September 2000 and the removed SRM is since then incinerated either in incinerators attached to slaughterhouses or in steel factories etc..

Conclusion on the ability to avoid recycling

In light of the above-discussed information it is assumed that the BSE agent, should it have entered the territory of Greece, would have been recycled and potentially amplified at least until 2001 but probably even thereafter.

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, the total cattle population of Greece is currently 681,856 cattle of which 337,319 are dairy cattle (210,373 older than 24 months). The dairy cattle are kept in 19,884 holdings (in average 17 cattle per holding).

Bovines are mainly located in the northern and central part of Greece.

A differentiated age distribution of cattle is not provided, neither for cattle alive nor at slaughter.

Surveillance

BSE is notifiable since 1992 (Presidential Decree 133/92).

All animals destroyed in the framework of BSE diagnosis and / or eradication activities have always been compensated to their full commercial value.

According to the CD only histopathology was performed as method for examination of cattle for BSE prior to the application of rapid BSE tests that started in 2001. At least since the beginning of 2001, also immunohistochemistry is available in the National Reference Laboratory (FVO report of a mission February 2001).

Passive surveillance

The FVO report on a mission in September 2001 concludes that the number of clinical suspects notified and examined is still too small (table 4). The low number of BSE suspects supports the conclusion that the passive BSE surveillance in Greece is not efficient.

Year	N°. examined	N°. positive
1986-1996	14	0
1997	13	0
1998	8	0
1999	20 ¹	0
2000	22 ²	0
2001	4	0
2002 ³	0	0

Table 4: Number of laboratory tests for BSE (examined by histopathology)
^{1,2} only 1 (1999) and 4 (2000) animals were eligible for the monitoring programme (FVO mission reports). The minimum number of samples annually examined should be, according to OIE, around 30.
³ until 22 November 2002.

Additionally, 95 “contact animals” (animals belonging to the same feed- and / or birth cohort of BSE affected animals) were examined, including 27 from imported cattle. All 95 samples were negative for BSE using a rapid post mortem test.

Active surveillance

Since beginning of 2001 Greece is applying rapid BSE tests. In the framework of that active surveillance system, 17.113 bovines older than thirty months have been examined with rapid tests in the period 1/1/2001 to 31/12/2001:

Emergency slaughter and fallen stock	1.655
Normal slaughter	15.360
BSE eradication (herd culling)	95

From 1/1/2002 to 22/11/2002, 20.351 bovines have been examined, all with negative results:

Emergency slaughter and fallen stock and cattle sick at ante mortem	1.954
Normal slaughter	18.375
BSE eradication (herd culling)	22

One positive BSE-case was detected in the middle of 2001 in a healthy slaughtered cow born in 1996. The whole herd was culled and incinerated.

According to the FVO report of September 2001 it is not clear whether all fallen stock which has to be sampled is really examined due to potential under reporting of fallen stock (burial on farm). The CD highlights that all fallen stock notified to the veterinary service are invariably sampled and tested for BSE using a rapid post mortem test.

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 factors, mainly cross-contamination and surveillance plus culling, has to be estimated. The guidance provided by the SSC in its opinion on the GBR of July 2000 is applied.

Feeding:

Feeding ruminant MBM to cattle was legally possible until 1994. The available information on the control of the feed-ban of 1994 does not allow judging its efficiency. Therefore, feeding is considered "**Not OK**" before and after the ban in 1994. Since 1/1/2001, when the total feed ban of the EU was officially implemented feeding is considered "**reasonably OK**" because Greece did not provide any evidence that the feed ban is also enforced with on-farm-mixers.

Rendering:

Materials rendered include ruminant material. SRM and probably (some) fallen stock were included in rendering until the end of 2000. Before the end of 1997 rendering processes were not appropriate. Although the CD states that rendering plants were brought up to standard in 1997, no evidence for controls of appropriate process conditions was provided. Also the FVO report from the end of 1998 indicates that several rendering plants did not fully respect the pressure standard. Therefore rendering is assessed "**not OK**" until the end of 1998. Since 1999 rendering is considered "**reasonably OK**". If evidence would be provided that all plants reliably apply $133^{\circ}\text{C}/20^{\text{min}}/3^{\text{bar}}$ to all materials rendered, it could be considered being "**OK**".

SRM-removal:

There is an official SRM ban since the end of 2000 but evidence for reliable implementation is lacking. SRM was "**not OK**" until the end of 2000 and "**reasonably OK**" thereafter.

BSE surveillance:

The passive surveillance system, which was the only system in place until the end of 2000 was unable to detect low levels of BSE incidence. The passive surveillance system i.e. notification and examination of clinical cases is still insufficient.

The situation improved since 1 January 2001, when an active surveillance system was installed in parallel to the passive system. However, it seems that also the active surveillance system is not carried out satisfactorily due to a most probable underreporting of BSE risk animals (fallen stock). Although the first BSE case in Greece was detected by active surveillance, so far the number of examinations that have been carried out do not allow an estimation of the size of the epidemic in Greece.

Stability of the BSE/cattle system in <u>GREECE</u> over time					
Stability		Reasons			
Period	Level	Feeding	Rendering	SRM	Other*
1980 to 1998	Extremely unstable	Not OK	Not OK	Not OK	↓
1999 to 2000	Very unstable		Reasonably OK		
2001-	Neutrally stable	Reasonably OK	Reasonably OK	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.

On the basis of the available information it is concluded that the country's BSE/cattle system was extremely unstable from 1980 to 1998; i.e. it would have recycled and amplified BSE infectivity, should it have entered the system. With the improvement of the rendering system since 1999 it improved to very unstable. Since 2001 the system is considered to be neutrally stable due to the introduction of SRM removal and the transposition of the "total" feed ban. It has to be assumed that some recycling of the agent might still occur but amplification has been stopped.

4. CONCLUSION ON THE RESULTING RISKS

4.1 Interaction of stability and challenges

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

INTERACTION OF STABILITY AND EXTERNAL CHALLENGE IN GREECE			
Period	Stability	External Challenge	Internal challenge
1980 to 1995	Extremely unstable	Very high	Likely and growing
1996 to 1998		Extremely high	
1999 to 2000	Very unstable		
2001- at current	Neutrally stable		Likely but stable

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.

Imports of contaminated MBM would lead to an internal challenge in the year of import, if fed to cattle. Apparently the feeding system is of utmost importance in

this context. In the case of Greece it has to be assumed that imported MBM reached domestic cattle, even if feeding MBM to cattle was apparently not a large-scale practice. Therefore an internal challenge must be assumed to appear already in the early eighties, when potentially contaminated MBM exports to Greece (inter alia 13,201 tons from France in 1981) became available. Due to the extremely unstable system it is likely that the internal challenge started to grow due to recycling and amplification of the agent. In 1999, the system became very unstable and since 2001 the system is neutrally stable. If the EU-measures were perfectly implemented and enforced it would even be optimally stable. However, no evidence is provided on the implementation or the degree of implementation already realised.

In view of the above-described reflection the registered external challenges could have led to an internal challenge in Greece from 1981 onwards. This internal challenge met the very unstable system.

4.2 Risk that BSE infectivity entered processing

The BSE-agent was most likely imported into the country already in the early eighties via live cattle and MBM. A risk that BSE infectivity entered processing first existed therefore about 3 years after cattle, if infected prior to export in their countries of origin have been rendered, i.e. since 1984. MBM imports that could have reached and infected domestic cattle since 1981. These domestic cattle would have been processed from 1986 onwards, while approaching the end of their incubation period. Thus it is likely that BSE infectivity entered processing in Greece as early as 1984. Since then the processing risk increased continuously. It will start decreasing when the birth cohorts of cattle with a significantly lower risk of being infected reach the normal processing age.

4.3 Risk that BSE infectivity was recycled and propagated

Given the extremely unstable system it is likely that BSE infectivity was recycled and propagated as soon as it entered processing; i.e. since 1984. Recycling and propagation continued to be highly likely until 2000 and is constant since then.

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, as it is confirmed at a lower level that domestic cattle are (clinically or pre-clinically) infected with the BSE-agent.
- Also the risk factors indicate that the presence of BSE in domestic cattle is likely and was so since some time.

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

- As long as the system remains neutrally stable, the probability of cattle to be pre-clinically or clinically infected with the BSE-agent will remain but will not grow anymore even if the external challenge continues to be at such a high level as in the past.

5.3 Recommendations for influencing the future GBR

- Improving the stability of the system, by ensuring that no MBM is fed to cattle but also confirming that SRM and fallen stock do not enter the feed chain and that all rendering plants operate at $133^{\circ}\text{C}/20^{\text{min}}/3^{\text{bar}}$, will reduce the GBR over time. In this respect it seems of high importance to include also on-farm-mixers in the controls of the feed ban.
- A better surveillance, e.g. by sampling more at-risk cattle (fallen stock and emergency slaughter) by means of rapid screening would improve the basis for controlling the efficiency of the stability enhancing measures. In this respect it is very important to sample all fallen stock over 24 months of age.