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**THE EFFECT OF BEEF IMPORT BANS
BY FRANCE AND GERMANY**

On U.K. Beef Prices.

Anthony Ballance.

University of Manchester.

June 1990.

WP 90/06



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THE SUBJECT OF THIS REPORT WAS
BY FRANK AND GERALD
ON U.S. BIRTH RECORDS
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The decisions taken recently by the French and German governments to ban the importation of all British beef products (which have now been reversed) following public and media concern over the possible effects of consuming beef contaminated with Bovine Spongiform Encephalopathy (B.S.E.), has been of major concern to the British government and farming population.

Following the development of an econometric model of the U.K. beef market capable of explaining how beef (and other red meat product) prices are formulated at the producer level carried out at the University of Manchester we are able to assess the impact of such bans on British beef imports on British beef prices.

The model consists basically of a set of inverse demand functions to explain the determination of prices where the price of meat i can be regarded as a function of the supply of meat i , and all other meats j , as well as meat expenditure M . i.e.

$$P_i = f(X_i, X_j, M, u_t).$$

Five meat commodities are identified within the model, Steer Beef, Other Beef, Mutton and Lamb, Bacon and Ham and Pork. Beef was disaggregated in this way because the beef intervention system has been restricted to steer beef and it was envisaged that the impact of intervention would be different for the two classifications. Further detail of the model is provided in Ballance (forthcoming).

From our modelling of the U.K. beef market we generated the following table of price flexibilities from the estimated parameters in the model where the price flexibility is defined as follows:

$$f_{ij} = \frac{\text{percentage change in the price of good } i}{\text{percentage change in the quantity of good } j}$$

The following key applies:

Commodity code: 1 = mutton & lamb, 2 = steer beef, 3 = other beef, 4 = bacon & ham, 5 = pork.

Seasonal code: 1 = spring, 2 = summer, 3 = autumn, 4 = winter.

Table 1 : Flexibilities for the Direct Translog Model, by Season

Quarter 4

with respect to quantity

Group	1	2	3	4	5
1	-0.386	-0.050	-0.054	0.056	0.093
2	-0.111	-0.418	-0.351	-0.007	0.018
3	-0.097	-0.309	-0.520	0.043	0.120
4	-0.151	-0.290	-0.181	-0.605	-0.811
5	-0.136	-0.216	-0.109	-0.412	-0.953

Quarter 3

with respect to quantity

Group	1	2	3	4	5
1	-0.421	-0.015	-0.072	0.059	0.095
2	-0.082	-0.456	-0.317	0.013	0.046
3	-0.087	-0.280	-0.487	0.082	0.176
4	-0.153	-0.276	-0.227	-0.548	-0.873
5	-0.144	-0.206	-0.150	-0.461	-0.931

Quarter 2

with respect to quantity

Group	1	2	3	4	5
1	-0.422	-0.052	-0.035	0.065	0.098
2	-0.098	-0.383	-0.340	0.024	0.059
3	-0.071	-0.276	-0.531	0.075	0.150
4	-0.148	-0.321	-0.174	-0.549	-0.853
5	-0.147	-0.265	-0.108	-0.471	-0.923

Quarter 1

with respect to quantity

Group	1	2	3	4	5
1	-0.485	-0.025	-0.053	0.057	0.083
2	-0.076	-0.401	-0.345	0.024	0.051
3	-0.068	-0.295	-0.478	0.090	0.174
4	-0.135	-0.294	-0.212	-0.539	-0.874
5	-0.139	-0.244	-0.149	-0.495	-0.924

If one can calculate the percentage increases in the domestic supply of beef as a result of not being able to export beef to France and Germany one can use the flexibilities above to calculate by how much prices will fall.

It should be noted that BSE will have two effects on meat prices. The first is a change in consumer preferences away from beef and towards other meats. These changes of course have an impact on the prices of the various meats. The second effect is the effect of an increase in domestic supply of beef following an export ban. This paper deals only with the effect of the latter, taking the changes in tastes as given.

In doing this analysis we have assumed that the shifts in consumer preferences as a result of BSE have not affected the flexibilities of the demand system (i.e. the demand curves have been shifted, but their slopes left unchanged). This is obviously a strong assumption to make, but one that is inevitable if we are to try and quantify the effect of the import bans imposed by France and Germany.

We will calculate what the effect will be on the monthly prices (given that the model was estimated using monthly data) of beef and the other red meat prices using data for 1989. Given that supply and price levels in the beef market up until recently were not too dissimilar to last year this can be taken as a reasonable guide to the price effect that may come about. If we take then the amount of exports that went to France and Germany add them to domestic supply of beef and see what the percentage change is in domestic beef supply we can assess the impact this would have on beef and other red meat prices (for 1989).

The calculations are also made a little more complex in that we have disaggregated beef into steer beef and other beef whereby it is assumed that trade in fresh and chilled beef effects the domestic supply of steer beef and the trade in frozen beef effects the domestic supply of other beef (reasons for this are given in Ballance (forthcoming)). We must assume that some of the beef imported by France and Germany from Britain is frozen and some fresh and chilled. We will split the total imports made by France and Germany proportionately for each month based on the total monthly export figures for the U.K. for 1989.

The following table below illustrates the levels of imports of British beef to France and Germany, the total level of EEC imports of British beef and the total U.K. beef exports by month for 1989.

Table 2.

1989	Imports by France and Germany ('000 tonnes)				U.K. Beef Exports for 1989. ('000 tonnes)		
	French	German	Total French & German	Total EEC	Total Fresh & Chilled	Total Frozen	Total
Jan	6.3	0.7	7.0	8.7	7.8	1.4	9.2
Feb	4.4	0.2	4.6	6.5	5.4	2.1	7.5
Mar	7.8	0.4	8.2	11.6	9.1	4.3	13.4
Apr	4.1	0.9	5.0	7.9	5.6	4.7	10.3
May	4.9	0.6	5.5	7.8	6.6	3.6	10.2
Jun	5.0	0.9	5.9	8.6	7.4	7.0	14.4
Jul	5.1	1.1	6.2	9.0	7.3	3.5	10.8
Aug	5.5	1.1	6.6	8.8	7.8	5.2	13.0
Sep	6.6	1.1	7.7	10.4	9.3	4.4	13.7
Oct	7.6	1.1	8.7	12.5	9.8	4.4	14.2
Nov	7.2	0.7	7.9	10.1	9.5	2.1	11.6
Dec	6.8	0.4	7.2	10.0	9.2	2.4	11.6

From Table 2 we calculated the level of imports made by France and Germany of fresh and chilled, and frozen beef which allows us to calculate in the table below the percentage change in the domestic supplies of steer and other beef.

Table 3.

1989	U.K. Beef Domestic Supply ('000 tonnes)		British Beef Imports made by France & Germany		Percentage Change in the Domestic Supply of U.K. Beef	
	Steer Beef	Other Beef	Fresh & Chilled	Frozen	Steer Beef	Other Beef
Jan	46.6	36.1	5.9	1.1	+13	+3
Feb	51.8	30.1	3.3	1.3	+6	+4
Mar	46.7	34.1	5.6	2.6	+12	+8
Apr	50.7	34.1	2.7	2.3	+5	+7
May	44.2	30.2	3.6	1.9	+8	+6
Jun	43.4	30.2	3.0	2.9	+7	+10
Jul	43.0	31.5	4.2	2.0	+10	+6
Aug	43.5	34.0	4.0	2.6	+9	+8
Sep	53.1	32.6	5.2	2.5	+10	+8
Oct	53.2	32.6	6.0	2.7	+11	+8
Nov	45.4	38.4	6.5	1.4	+14	+4
Dec	42.1	32.4	5.7	1.5	+14	+5

We can now calculate using the flexibilities in Table 1 illustrated above the percentage changes in prices as a result of French and German beef import bans. Obviously we use the different quarterly flexibilities according to the month we are considering and calculate the effects using the following formula.

$$\% \Delta P_1 = \% \Delta X_2 * f_{12} + \% \Delta X_3 * f_{13}$$

Where,

- P_1 = price of meat i.
- X_2 = domestic supply of steer beef.
- X_3 = domestic supply of other beef.
- f_{12} = price flexibility with respect to supply of steer beef.
- f_{13} = price flexibility with respect to supply of other beef.
- $\% \Delta$ = percentage change.

The results are shown in the table below.

Table 4. Percentage changes in the prices of each meat.

	Steer Beef	Other Beef	Mutton & Lamb	Bacon & Ham	Pork
1989					
Jan	-7	-5	-1	-4	-3
Feb	-4	-4	-1	-3	-2
Mar	-8	-7	-1	-5	-5
Apr	-4	-5	-1	-3	-2
May	-5	-5	-1	-4	-3
Jun	-6	-7	-1	-4	-3
Jul	-6	-6	-1	-4	-3
Aug	-6	-7	-1	-4	-3
Sep	-7	-7	-1	-5	-3
Oct	-8	-7	-1	-5	-3
Nov	-8	-6	-1	-5	-4
Dec	-8	-7	-1	-5	-4

We now then have an idea of the magnitudinal effects of a beef import ban by France and Germany on U.K. beef prices. We can now make an estimate of the effect of the beef import ban on producer revenues. We will do this only for the two beef products.

In order to make our calculations as accurate as possible we inflated the 1989 prices by a factor equal to the percentage change in an individual price from it's average level in January 1989 to it's average level in January 1990.

We will only calculate the changes in revenues for the last six months of 1990 as the ban on beef imports by both France and Germany came at the end of May 1990,

This will be done firstly by calculating the total revenue that would have been generated by beef in the last six months of 1990. We assume that the exported beef receives the same price as domestic beef. The figures generated are shown in the table below.

Table 5. Total Revenues Forecast for June to December 1990. in £000 with No U.K. Beef Import Ban.

	Steer Beef	Other Beef
1990		
Jun	101612	72554
Jul	103163	73066
Aug	126786	78846
Sep	127045	75327
Oct	125960	75109
Nov	111435	84475
Dec	101817	71231

The table below then shows the fall in revenues that occur as a result of a ban on British beef imports by France and Germany.

Table 6.

Fall in revenue for June to December in £000 as a result of a U.K. Beef Import Ban.

	Steer Beef	Other Beef
Jun	6097	5079
Jul	6190	4384
Aug	7607	5519
Sep	8893	5273
Oct	10077	5258
Nov	8915	5069
Dec	8145	4986
Total	55924	35568

TOTAL LOSS IN REVENUES TO BEEF FROM
A U.K. IMPORT BAN FOR A 7 MONTH PERIOD £91,492,000

We can see from these results that an import ban by France and Germany would have a very significant consequence for farm revenues from beef alone. Obviously the figure above would increase substantially if we added the losses from the other red meat products as well. There may also be a knock-on effect to other meats such as chicken which are not specified in our model. We can conclude then that if an import ban on British beef was continued by France and Germany this would have a severe impact on the market prices for U.K. meat prices, and thus farm revenues.

Ballance, A.J. (forthcoming) The Determination of Market Prices Under the EEC Support System of Selected Agricultural Products. PhD. Thesis. University of Manchester.



