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REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie

THE IMPACT OF IMPORTS TAXATION ON LOCAL MEAT PRODUCTION AND CONSUMPTION

by
Lapodini ATOUGA

May 1991

Cameroon Agricultural Policy and Planning Project

Produced with technical assistance from Washington State University and the Consortium for International Development under funding from USAID/Cameroun Contract No. 631-0059-C-00-9015-00

INTRODUCTION:

In January of 1988, the Cameroonian government decided to levy a tax on imported meats. The purpose of this tax was to curb im-ports of low quality meats, and promote local products by shielding them from the unfair competition of subsidized meats, imported mostly from EEC countries. When the decision was taken, the government indicated that it "would monitor the impact of the meat import tax on the consumption and prices of locally produced meat in order to correct, if necessary, any undesirable effects" [3].

Two years after this policy was first implemented, the following study was undertaken to investigate the policy's impact on several factors namely local production, and consumption of low income people (people with annual income less than $120 [3]). Since the policy was implemented in January of 1988, two studies [1;2] had been undertaken to assess its major effects on the livestock sector. The two studies were more descriptive than analytical. In these studies, the authors described compiled statistics that they gathered from interviewing meat importers and port authorities in Douala. The present study based most of its recommendations on analytical conclusions derived from a model built on economic theory. The overall objective of this study was to measure the impact of the policy decision and to suggest corrective measures to decision makers. The specific objectives were:

1. To develop an econometric model of the structural relationships that portray demand for meats in Cameroon.

2. To Estimate the parameters of the model and derive the coefficients of elasticities and impact multipliers.

3. To use the coefficients of elasticities and impact multipliers a) to evaluate, under different scenarios, the impact of taxation of meat imports on meat consumption by low income population, and b) to derive the economic implications and make recommendations to policy makers.

Cameroon is between 70 and 75 percent [3] self sufficient in animal proteins. This implies that imports of animal meats and/or fish are inevitable if local demand for animal proteins is to be met. With a population increase of about 3.0 percent per annum [4], the gap between demand and production of animal proteins could widen if appropriate policy measures are not taken for the latter to keep up with the population growth. These measures should take into account all sources of meats, local as well as imports. The major task for decision makers should consist then of devising a series of policies measures conducive to the growth of the sector. These policies should strick a balance between long

term objectives, mainly the attainment of a higher percentage of self sufficiency, and the general needs of the population, and in particular the needs of each segment of the population. One of the major objective of this paper was to assess the contribution, of the 1988 policy of levying a higher tax on meat imports, on stricking such a balance. The contribution of this study will be both methodological and practical, and provide policy makers with alternative measures for decision making. The paper comprises four parts: the first part presents the conceptual model; the second describes the analytical approach; the third part deals with the data used for analysis; and finally the results of the analysis along with the conclusions and recommendations are presented in the last section.

A - THE CONCEPTUAL MODEL

In seeking to attain the objective of this study, the following econometric model was developed. The model is a simultaneous system of equations that includes five categories of relationships: a demand equation, a farm-retail price equation, an import equation, a supply equation, and an identity. The "t" in parentheses refers to the current period, while (t-1) and (t+1) refer to preceeding and succeeding periods, respectively.

(1) Demand Relation for Meats

$$PC(t) = f[PM(t), PF(t), RI(t), TM(t)]$$

(2) Farm-Retail Price Relation

$$MM(t) = f[QM(t), PM(t), TP(t), TM(t)]$$

(3) Import Relation

$$IM(t) = f[CA(t), QM(t), IM(t-1)]$$

(4) Supply Relation for Meats

$$QM(t) = f[MM(t), QM(t-1), IM(t), IV(t)]$$

(5) Identity

$$PC(t) = QM(t) + IM(t)$$

There are two categories of variables in these relations: the endogenous variables (PC(t), MM(t), IM(t), QM(t), PM(t)) and the predetermined or exogenous variables (PF(t), RI(t), TM(t), QM(t-1), TP(t), CA(t), IV(t), IM(t-1)). These variables are defined as follow:

I - The Endogenous Variables

PC(t) = Per capita annual consumption of all meats, kilograms. It is equal to the total annual meat disapearence divided by the population size. Current period.

MM(t) = Average price of live cattle, first price paid to cattle owner on the market, francs per 100 kilograms of liveweight. Current period.

PM(t) = Weighted average retail price of all meats or equivalent in Douala and Yaounde, francs per kilogram. Current period.

IM(t) = Per capita imports of all meats or equivalent, kilograms. It is equal to total import of meats divided by the population size. Current period.

QM(t) = Per capita production of all meats, kilograms. It is equal to the total meat production divided by the population size. Current period.

II - The Predermined or Exogenous Variables

PF(t) = Average retail price of fish in Douala and Yaounde, francs per kilogram. Current period.

RI(t) = Real disposable personal income, thousand francs. Current period.

TM(t) = Time, expressed as the last two digits of each period. For example 1960 period is coded as 60.

QM(t-1) = Per capita production of all meats, kilograms. Previous period.

TP(t) = Average cost of transportation one animal, thousand francs per kilogram of liveweight. Current period.

CA(t) = Average CAF price, francs per kilogram. Current period.

IV(t) = Inventory of cattle, million heads. Current period.

IM(t-1) = Per capita imports of all meats, kilograms. Previous period.

III - The Theoretical Considerations Underlying Each Relationship

1. Demand Relation for Meats, Eqation 1

The first relation, equation 1, is stated in the traditional form with consumption of meats expressed as an explicit function of the average price of meats, real disposable personal income, the price of fish, and a time variable. The theoretical fundation of this relation is the traditional Marshallian concept of demand. The demand relationship for a product, in the traditional Marshallian framework, considers the quantity of the product (consumed) as being determined by: the price of the product and

the prices (or quantities demanded and consumed) of substitute and complementary products; the disposable income spent on food purchases which varies in proportion with income classes; changes in population, which may be captured by per capita form of the data used; eating habits expressing tastes and preferences; temperature in different seasons which may cause seasonality in the demand for the product; and institutional factors such as monthly variations in slaughter days affecting the demand reflected through intermediate stages of the marketing system. The main features of this equation are built on this foundation.

2. Farm-Retail Price Relationship, Equation 2

This relationship was constructed using three theoretical concepts. They are the marketing margin concept, the derived supply and demand concept, and the primary demand and supply concept. In the equation portraying the above relationship, the farm price of meat animals is regressed against the retail price of meat, per capita production of meat, marketing cost (treking, transportation, etc..) and a trend variable (time).

The demand for meat animals is based on the retail level demand for meat minus the marketing costs, such as slaughtering, processing and transportation costs. Shifts in the primary demand and/or changes in marketing margins will induce a change in the derived demand for a product. Therefore a change in the retail price of a product will entail a change in the farm price. The marketing margin, thus, constitutes an explanatory variable in the farm-retail price relation.

The difference between the producer or farm price and the retail or consumer price is the marketing margin. It is the collection of services rendered to transform and bring the product to the consumer. These services include transportation and other labor cost. Here in Cameroon, treking is a major labor cost, thus the inclusion of treking as an explanatory variable in this relationship.

3. Import Relation, Equation 3

The most difficult relation to model is that of meat imports. One of the problems, in specifying an import relation, is the price to be used. The question is: do imports depend on local or foreign prices? In this study the CAF price is used. Data on imports in tables (3 et 4) suggest that it determines the level of imports more than any other variable.

Other explanatory variables in the relation are the previous year level of imports [IM(t-1)] and the level of local meat production [QM(t)].

4. Supply Relation for Meats, Equation 4

The equation portraying this relation stipulates that the quantity of meats supplied QM(t), is function of average price of live cattle MM(t), the level of imports IM(t), inventories of meat animals IV(t), and the level of meats production from the preceeding period QM(t-1).

5. Identity, Equation 5

It is the last equation in the system. The purpose of having this equation is to complete the model. In a system of equations with N endogenous variables there should be N equations. Identities such as the one specified in this model, are often used to close the system when the number of equations do not match the number of endogenous variables.

To estimate these relations, time series data for a period of at least fifteen (15) or twenty (20) years, were required. Because of the lack of a long list these annual time series data, an annual serie for seven years was constructed from the existing of data. The nature of the model preclude the choice of some estimation procedures to derive the estimators of the structural parameters.

Since the model is system of simultaneous equations consisting of interrelated structural equations in which endogenous variables appear on both side of the equations, the Three Stage Least Squares (3SLS) method of estimation, proposed by Zellner and Theil [5], was used to derive the estimates of the parametres. These estimates were then used to compute the coefficients of elasticities.

B - THE ANALYTICAL APPROACH

To measure the impact of taxing imported meats on local production and consumption of meats by low income people, the parameters of the equations of the above model were estimated in order to derive the coefficients of price and income elasticities. The results of the estimations are reported in table 1 of the annex. The coefficients of elasticities measure the percentage change in the quantities (consumed or produced) due to a one percentage change in prices and/or income. The increase of taxes on imported meats had two effects. First it increased the price of imported meats by a percentage equal to [((Pb x 100)/Pa)-100] where Pa is the price without the import tax, and Pb is the price of imported meats taxed. This increase will in turn lead to an increase of the weighted average price of meat [PM(t)] of the year 1988 as compared to the 1987 weighted average price. The weighted

average price of meat was computed as follows: PM(t) = (P1Q1 + P1iQ1i + P2Q2 + P2iQ2i + ...+ P5Q5 + P5iQ5i)/(Q1 + Q2 +....+ Q5) where P is the price of the category of meat, Q the quantity, the

numbers 1 through 5 designate beef, chicken, pork, lamb and mutton, and trips and others, and finally the i stands for imports. Let.s take beef for example. In 1987 the average price of beef P1 was 1,050 fCFA, the quantity of beef Q1 was 17,644 tons; the average price of imported beef P1i was 637 fCFA, and the imported quantity Q1i was 7,879 tons. Therefore the weighted average price of beef in 1987 PM(t-1) was equal to [(1,050 x 17,644) + (637 x 7,879)]/ (17,644 + 7,879). For 1988, P1 was 1,050 fCFA; Q1 was 20,775 tons; P1i was 1,979 fCFA; and Q1i was 682 tons. The 1988 weighted average price PM(t) was [(1,050 x 20,775) + (1,979 x 682)]/(20,775 + 682). The increase in the weighted average price due to the new tax is equal to [100 x PM(t)]/PM(t-1). The computation yielded an increase of 17.01 percent. For the five categories of meat, the increase was 14.83 percent.

Second it decreased the purchasing power of each segment of the population. According to a national survey, cameroonians spend 52.80 percent of their budget on food consumption and 24.20 percent of their food budget on meat purchase. It follows from these two statistiques that the an increase in the price of meat will induce a decrease in the budget allocated for meat purchases. The decrease will be equal to (14.83% x 24.20% x 52.80%) or 1.89 percent. The combine effects of these two changes (an increase in the weighted average price of meat and a decrease in the purchasing power for meat) will yield the total impact of taxing imported meats on consumption. The model was estimated several times to reflect the situation of different levels of disposable income. The same variables were used in the two estimations. The only difference was the level of the income variable which was set as one tenth, one eighth, one fifth, and one fourth of the level of the national

disposable income in the last estimations in order for the model to capture the situation prevailing in the low income segment of the population.

The general approach in this study was first to analyze production and imports data from January 1987 through June 1989 in order to determine if the policy measure has had an impact on them. Then, to estimate the impact on consumption (specifically low income people's consumption) with derived elasticities from the estimated parameters of the conceptualized model above.

C - THE DATA

The preliminary analysis in this study was based on data for the period of January 1987 through June 1989. Tables T1, and T2, show respectively, monthly and quarterly data on slaughter from SODEPA, the main producer of meats consumed in the metropolitain areas of Yaounde and Doualawhere the bulk of the imported meats are consumed. Tables T3, and T4, contain data on imports of different categories of meats, while tables T5 and T6 display data on monthly and quarterly supply of the same categories of meats. Tables T7 and T8 show monthly and quarterly data on all red meats,

fish, and poultry imports. Figures F1, F2, F3 and F4 are respectively graphs showing the evolution of monthly imports of all meats, and monthly imports of beef, monthly imports of poultry and finally imports of fish for the years 1987 and 1988.

The data in table T1 indicate that between January 1987 and June 1989, the average monthly production of all red meats was
about 1,900 tons. This average did not change drastically between January 1988 and June 1989 to indicate that the tax levied on
imported meats induced an increase in local production. A slight

increase of about 100 tons above the average was reached during five months, between September 1988 and January 1989. Meanwhile data in table T3 indicate that total imports of all red meats, during the first ten months of 1988, fell by 95 percent in comparison to the 1987 imports for the same period (from 5,300 tons to 450 tons). The gap, created between the 1987 and 1988 levels of meats imports by the taxation, can be observed on Figure F1. Data in tables T7 and T8 and figure F3 show that imports of poultry also fell sharply in 1988.

It follows from these observations that the net effect, of levying a tax on imported meats, is a decrease of total meats available on the market. Although SODEPA's production increased slightly in 1988, the decrease in meats imports overweight the gain from the increased production. Consequently total consumption of meats in Cameroon, (especially in Douala and Yaounde where the bulk of imported meats are retailed and consumed) has decreased as a results of this policy measure. Although there is no support at the present time, we are incline however to say that most of the decline in meats consumption are cut-backs from low income families from Douala and Yaounde. In order to ascertain this conclusion, it would be appropriate to survey a sample of at least two hundred (200) low income families in the two metropolitain areas. Furthermore, to determine the real impact of taxation of imported meats on local production in general and on meat consumption by low income people, the hypothesized model was estimated using differnet per capita income [RI(t)] for that segment of the population. The parameters of the structural relations of the model were estimated using these differnt levels of income. The coefficients of elasticities were derived from the estimated parameters of the model's structural relationships, and then used in computing the quantitative changes in consumption and production.

The annual time series data required to estimate the model are not readily available. Some of these time series of data were constructed from the existing data by way of projection. As we go along and more data are gathered, the model could be estimated with the new data and we could simulate the consequences of the policy measure based on new hypothesized situations or scenarios.

D - SIMULATION RESULTS AND POLICY IMPLICATIONS

The magnitude of change in consumption and production of meats, due to the tax imposed on imported meats, will depend on the size of the coefficients of price and income elasticities. By definition, elasticities are the percentage changes in quantities (demanded and supplied) due to a one percent change in prices or income. The size of the coefficients of elasticities could fall between zero and infinite. If for example the coefficient of price elasticity of demand for meat is 1.0 (one), this implies that a ten percent change in price will induce a ten percent change in demand for meat.

Although the coefficients of elasticities could take any value between zero and infinite, experience has shown that their range is smaller than zero to infinite. In this study, the coefficients ranged from 1.47 to 2.03 with a mean of 1.83. The impact of the policy measure was examined under four scenarios with two different price increases. Under scenario 1 the low income segment of the population was supposed to have an income level equale to one tenth the national income. Scenarios 2, 3, and 4 the level were one eighth, one fifth, and one fourth respectively. The difference between the derived coefficients of elasticities from these different scenarios were not too far apart.

Therefore the mean of these elasticities was used in evaluating the quantitative impact of the policy decision. The change in the average price of meat [PM(t)], due to the 1988 taxation of imported meats, was an increase of 14.38 percent i.e. from January 1988 the weighted average price of meat was on the average 14.38 percent higher than the weighted average price of 1987. The 1988 weighted average price of beef on the contrary was 17.01 percent higher than the 1987 weighted average price. According to MINEPIA official the price of beef is a good indicator of price of meat in Cameroon. Therefore, the effects of the decision to increase the tax on imported meats, were examined under the four scenarios specified above with first the assumption that the weighted average price of meats increased 14.83 percent and second by 17.01 percent.

With the first assumption i.e. PM(t) increased by 14.83 percent, the budget allocated to meat will decrease by (52.80% x 24.20% x 14.83%). Given the derived average price elasticity of demand equal to -1.83, and the average income elasticity of demand equale to 1.43, the quantity of meat consumed will decrease by: (-1.83 x 14.83%) + [1.43 x (14.83% x 24.20% x 52.80%)] = 29.83 percent. If the second assumption is considered, assuming that the price of beef is a good indicator of meat prices, the decrease will be (-1.83 x 17.01%) + [1.43 x (17.01 x 24.20% x 52.80%)] = 34.22 percent. The above results indicate that the policy of levying a tax on imports of meats should be reviewed. With an already low per capita intake of meats (15 kilogramme per year), the various policies of the GRC should be geared toward increasing meat consumption instead of decreasing it. Furthermore this decrease in not compatible with the government policy of reaching a consumption level of 30

kilogrammes per capita by year 2.000. For low income families with an annual per capita intake of meat bearly reaching 10 kilogrammes, a deacrease of 29.83 percent or 34.22 percent implies a reduction of 2.98 or 3.42 kilogrammes in their annual consumption of meat. This decrease would be desastreous to their nutritional balance.

Although these preliminary results of the estimated model are reasonable, they need to be tested further to ascertain the validity of the findings. Some of the parameters were not statistically significant, therefore the stability of the parameters of the structural relationships in the model could be questionnable. The data used in estimating the structural parameters of the model were mostly constructed from the existing data whoes reliability were already questionable. Despite these limitations, the results obtained represent a good starting point for further analysis.

E - CONCLUSIONS AND RECOMMENDATIONS

Although the two main objectives (reduce and/or stop imports of low quality meats, protect local production) of the policy decision seem to have been attained, the net effect of the 1988 decision to tax imported meat is a reduction of the supplied quantities of meats on the market. Therefore meat consumption decreased as a result of the policy measure. Results of this study indicate that on the average per capita consumption of meat among low income groups decreased by 2.98 to 3.42 kilograms. Consequently, the Ministry of Livestock, Fisheries, and Animal Industries should review the policy decision of taxing imported meats. Specifically,

1. the authorities should first make sure that the results of this study are ascertained. Therefore they should sample and follow about 200 poor families in the urban areas of Douala and Yaounde.

If the results of their survey confirm the findings of this study, then they should:

2. revise the tax level, and set it such that the level of consumption is at least maintained;

3. reinforce the quality controle for imported meats, both at the ports in the exporting countries and in Douala; and

4. review the system of meat price fixing, and/or make meat imports contercyclical to domestic production of meats.

ANNEX I: Tables T1, T2, T3, T4, T5, T6, T7, T8 and T9

Table 1: (T1) Monthly Slaugther from SODEPA (tons)

MONTHS	EQUINE	BEEF	PORK	MUTTON	TRIPE	OTHERS	TOTAL
1987							
January	2	1,504	26	3	211	0	1,746
February	2	1,281	29	2	186	0	1,500
March	1	1,336	29	3	201	0	1,570
April	2	1,310	31	2	200	0	1,545
May	2	1,415	24	3	204	0	1,648
June	1	1,381	31	2	193	0	1,608
July	2	1,556	29	2	220	0	1,809
August	1	1,419	19	2	194	0	1,635
September	1	1,534	24	2	198	0	1,759
October	2	1,547	29	2	207	0	1,787
November	1	1,553	24	1	206	0	1,785
December	2	1,808	39	1	257	0	2,107
1988							
January	2	1,519	24	2	220	0	1,767
February	1	1,476	23	2	221	0	1,723
March	1	1,540	29	2	230	0	1,802
April	1	1,685	34	1	254	0	1,975
May	2	1,658	21	1	248	0	1,930
June	2	1,717	24	1	246	0	1,990
July	3	1,835	19	0	261	0	2,118
August	1	1,471	18	2	268	0	1,760
September	0	1,904	25	2	267	0	2,198
October	1	1,861	22	1	258	0	2,143
November	1	1,934	19	1	283	0	2,238
December	0	2,175	37	1	320	0	2,533
1989							
January	1	1,810	18	1	274	0	2,104
February	1	1,558	16	1	237	0	1,813
March	1	1,665	23	1	266	0	1,956
April	1	1,588	17	1	248	0	1,855
May	1	1,744	18	1	273	0	2,037
June	2	1,760	19	2	268	0	2,051

Table 2: **(T2) Quarterly Slaugther from SODEPA** (tons)

QUARTERS *	EQUINE	BEEF	PORK	MUTTON	TRIPE	OTHERS	TOTAL
Q3 84/85	0	2,672	0	0	399	0	3,071
Q4 84/85	0	2,751	0	0	411	0	3,162
Q1 85/86	0	2,724	0	0	407	0	3,131
Q2 85/86	0	4,956	0	0	738	0	5,694
Q3 85/86	0	4,621	0	0	690	0	5,311
Q4 85/86	0	4,581	0	0	684	0	5,265
Q1 86/87	5	4,764	111	8	633	0	5,521
Q2 86/87	2	5,273	115	9	707	0	6,106
Q3 86/87	5	4,121	84	8	598	0	4,816
Q4 86/87	5	4,106	86	7	597	0	4,801
Q1 87/88	4	4,509	72	6	612	0	5,203
Q2 87/88	5	4,908	92	4	670	0	5,679
Q3 87/88	4	4,535	76	6	671	0	5,292
Q4 87/88	5	5,060	79	3	748	0	5,895
Q1 88/89	4	5,210	62	4	796	0	6,076
Q2 88/89	2	5,970	78	3	861	0	6,914
Q3 88/89	3	5,033	57	3	777	0	5,873
Q4 88/89	4	5,092	54	4	789	0	5,943

* The year goes from july to june. So, for example, the first quater (Q1) of the year comprises july august and september.

Table 3: (T3) Monthly imports of different categories of meats (tons)

MONTHS	EQUINE	BEEF	PORK	MUTTON	TRIPE	OTHERS	TOTAL
1987							
January	0	265	134	8	26	3	436
February	0	473	103	3	98	4	681
March	0	845	266	1	108	1	1,221
April	1	680	170	10	127	1	989
May	0	923	273	12	81	2	1,291
June	0	797	316	4	47	2	1,166
July	0	350	299	10	209	1	869
August	0	381	381	9	64	4	839
September	1	317	147	1	172	2	640
October	0	314	436	14	104	3	871
November	0	577	557	13	206	1	1,354
December	0	569	428	4	146	0	1,157
1988							
January	0	256	381	8	13	1	659
February	0	86	86	6	33	1	212
March	0	7	1	2	1	1	12
April	0	28	4	9	17	0	58
May	0	36	68	1	14	1	120
June	0	18	21	33	14	28	114
July	0	2	1	1	0	1	5
August	0	13	22	1	10	16	62
September	0	3	1	1	2	2	9
October	0	1	14	0	0	1	16
November	0	3	1	1	1	1	7
December	0	43	38	13	1	1	96
1989							
January	0	4	13	4	1	1	23
February	0	31	14	9	0	1	55
March	0	12	15	2	2	0	31
April	0	10	5	1	0	2	18
May	0	14	41	0	0	2	57
June	0	3	20	10	1	0	34

Table 3: **(T3) Monthly imports of different categories of meats** (tons)

MONTHS	EQUINE	BEEF	PORK	MUTTON	TRIPE	OTHERS	TOTAL
1987							
January	0	265	134	8	26	3	436
February	0	473	103	3	98	4	681
March	0	845	266	1	108	1	1,221
April	1	680	170	10	127	1	989
May	0	923	273	12	81	2	1,291
June	0	797	316	4	47	2	1,166
July	0	350	299	10	209	1	869
August	0	381	381	9	64	4	839
September	1	317	147	1	172	2	640
October	0	314	436	14	104	3	871
November	0	577	557	13	206	1	1,354
December	0	569	438	4	146	0	1,157
1988							
January	0	256	381	8	13	1	659
February	0	86	86	6	33	1	212
March	0	7	1	2	1	1	12
April	0	28	4	9	17	0	58
May	0	36	68	1	14	1	120
June	0	18	21	33	14	28	114
July	0	2	1	1	0	1	5
August	0	13	22	1	10	16	62
September	0	3	1	1	2	2	9
October	0	1	14	0	0	1	16
November	0	3	1	1	1	1	7
December	0	43	38	13	1	1	96
1989							
January	0	4	13	4	1	1	23
February	0	31	14	9	0	1	55
March	0	12	15	2	2	0	31
April	0	10	5	1	0	2	18
May	0	14	41	0	0	2	57
June	0	3	20	10	1	0	34

Table 4: (T4) Quaterly imports of different categories of meats (tons)

QUARTERS	EQUINE	BEEF	PORK	MUTTON	TRIPE	OTHERS	TOTAL
Q3 84/85	0	254	164	22	242	15	697
Q4 84/85	0	432	256	25	216	7	936
Q1 85/86	2	497	302	39	325	9	1,174
Q2 85/86	3	812	299	41	478	12	1,645
Q3 85/86	0	1,563	398	55	535	11	2,562
Q4 85/86	43	2,740	622	26	476	16	3,923
Q1 86/87	40	1,503	360	10	289	4	2,206
Q2 86/87	0	2,815	654	16	616	27	4,128
Q3 86/87	0	1,583	503	12	232	8	2,338
Q4 86/87	1	2,400	759	26	255	5	3,446
Q1 87/88	1	1,048	827	20	445	7	2,348
Q2 87/88	0	1,460	1,431	31	456	4	3,382
Q3 87/88	0	349	468	16	47	3	883
Q4 87/88	0	82	93	43	45	29	292
Q1 88/89	0	18	24	3	12	19	76
Q2 88/89	0	47	53	14	2	3	119
Q3 88/89	0	47	42	15	3	2	109
Q4 88/89	0	27	66	11	1	4	109

* The year goes from july to june. So, for example, the first quater (Q1) of the year comprises july august and september.

Table 5: **(T5) Monthly supply of different categories of meats** (tons)

MONTHS	EQUINE	BEEF	PORK	MUTTON	TRIPE	OTHERS	TOTAL
1987							
January	2	1,769	160	11	237	3	2,182
February	2	1,754	132	5	284	4	2,181
March	1	2,181	295	4	309	1	2,791
April	3	1,990	201	12	327	1	2,534
May	2	2,338	297	15	285	2	2,939
June	1	2,178	347	6	240	2	2,774
July	2	1,906	328	12	429	1	2,678
August	1	1,800	400	11	258	4	2,474
September	2	1,851	171	3	370	2	2,399
October	2	1,861	465	16	311	3	2,658
November	1	2,130	581	14	412	1	3,139
December	2	2,377	477	5	403	0	3,264
1988							
January	2	1,775	405	10	233	1	2,426
February	1	1,562	109	8	254	1	1,935
March	1	1,547	30	4	231	1	1,814
April	1	1,713	38	10	271	0	2,033
May	2	1,694	89	2	262	1	2,050
June	2	1,735	45	34	260	28	2,104
July	3	1,837	20	1	261	1	2,123
August	1	1,484	40	3	278	16	1,822
September	0	1,907	26	3	269	2	2,207
October	1	1,862	36	1	258	1	2,159
November	1	1,937	20	2	284	1	2,245
December	0	2,218	75	14	321	1	2,629
1989							
January	1	1,814	31	1	274	0	2,121
February	1	1,589	30	1	237	0	1,858
March	1	1,677	38	1	266	0	1,983
April	1	1,598	22	1	248	0	1,870
May	1	1,758	59	1	273	0	2,092
June	2	1,763	39	2	268	0	2,074

Table 6: **(T6) Quaterly supply of different categories of meats** (tons)

QUARTERS *	EQUINE	BEEF	PORK	MUTTON	TRIPE	OTHERS	TOTAL
Q3 84/85	0	2,926	164	22	641	15	3,768
Q4 84/85	0	3,183	256	25	627	7	4,098
Q1 85/86	2	3,221	302	39	732	9	4,305
Q2 85/86	3	5,768	299	41	1,216	12	7,339
Q3 85/86	0	6,184	398	55	1,225	11	7,873
Q4 85/86	43	7,321	622	26	1,160	16	9,188
Q1 86/87	45	6,267	471	18	922	4	7,727
Q2 86/87	2	8,088	769	25	1,323	27	10,234
Q3 86/87	5	5,704	587	20	830	8	7,154
Q4 86/87	6	6,506	845	33	852	5	8,247
Q1 87/88	5	5,557	899	26	1,057	7	7,551
Q2 87/88	5	6,368	1,523	35	1,126	4	9,061
Q3 87/88	4	4,884	544	22	718	3	6,175
Q4 87/88	5	5,142	172	46	793	29	6,187
Q1 88/89	4	5,228	86	7	808	19	6,152
Q2 88/89	2	6,017	131	17	863	3	7,033
Q3 88/89	3	5,080	99	3	777	0	5,962
Q4 88/89	4	5,119	120	4	789	0	6,036

* The year goes from july to june. So, for example, the second quater (Q2) of the year comprises october, november and december.

Table 7: (T7) Montly Import of red meats, poultry and fish

MONTHS	MEATS	POULTRY	TOTAL	FISH
1987				
January	436	522	958	5,221
February	681	469	1,150	3,664
March	1,221	571	1,792	4,093
April	989	394	1,383	5,488
May	1,291	655	1,946	4,810
June	1,166	670	1,836	7,470
July	869	337	1,206	6,318
August	839	324	1,163	3,582
September	640	350	990	4,565
October	871	769	1,640	4,946
November	1,354	791	2,145	4,652
December	1,157	1,146	2,303	6,556
1988				
January	659	245	904	8,338
February	212	50	262	5,597
March	12	18	30	5,109
April	58	62	120	4,535
May	120	81	201	5,318
June	114	65	179	4,355
July	5	44	49	3,280
August	62	58	120	3,630
September	9	35	44	5,444
October	16	1	17	6,072
November	7	38	45	6,702
December	96	73	169	6,548
1989				
January	23	78	101	6,423
February	55	17	72	5,272
March	31	132	163	3,583
April	18	16	34	6,128
May	57	16	73	2,410
June	34	8	42	8,487

Table 8: (T8) Quarterly Import of red meats, poultry and fish

QUARTERS	MEATS	POULTRY	TOTAL	FISH
Q3 84/85	697	1,003	1,700	13,854
Q4 84/85	936	867	1,803	11,231
Q1 85/86	1,174	987	2,161	15,216
Q2 85/86	1,645	1,410	3,055	15,372
Q3 85/86	2,562	1,207	3,769	16,821
Q4 85/86	3,923	1,531	5,454	17,001
Q1 86/87	2,206	1,326	3,532	15,020
Q2 86/87	4,128	2,040	6,168	25,237
Q3 86/87	2,338	1,562	3,900	12,978
Q4 86/87	3,446	1,719	5,165	17,768
Q1 87/88	2,348	1,011	3,359	14,465
Q2 87/88	3,382	2,706	6,088	16,154
Q3 87/88	883	313	1,196	19,044
Q4 87/88	292	208	500	14,208
Q1 88/89	76	137	213	12,354
Q2 88/89	119	112	231	19,322
Q3 88/89	89	227	336	15,278
Q4 88/89	93	40	149	17,025

Table 9: (T9) NUMBERS OF ANIMALS SLAUGHTERED YEARLY BY PROVINCE (INSPECTED CATTLE SLAUGHTER)

PROVINCE	1986/1987	1987/1988	1988/1989
ADAMAOUA	28,820	25,946	31,991
CENTER	72,131	73,747	NA
EAST	10,480	15,404	14,017
EXT.-NORTH	28,774	30,620	21,530
LITTORAL	54,366	56,825	NA
NORTH	23,678	24,022	29,109
NORTH-WEST	14,710	16,986	16,981
WEST	25,167	26,102	28,764
SOUTH	3,406	3,767	4,649
SOUTH-WEST	10,144	9,318	11,467
TOTAL	271,667	282,737	NC

NA = Data Not Available
NC = Total Not Computed

ANNEX II: FIGURES F1, F2, F3, and F4

Figure 1: (F1) Monthly imports of total red meat and poultry (1987 and 1988)

Figure 2: (F2) Monthly imports of Beef 1987 and 1988)

Figure 3: (F3) Monthly imports of poultry (1987 and 1988)

Figure 4: (F4) Monthly imports of fish (1987 and 1988)

ANNEX III: ESTIMATED 3SLS EQUATIONS OF THE MODEL

$$PC(t) = 432.0 - .354PM(t) + 4.589RI(t) - .617PF(t) + 55.082TM(t)$$
$$(11.60) \quad (-1.74) \quad (+3.93) \quad (0.37) \quad (+7.36)$$

$$MM(t) = -43.7 + .524PM(t) - .015TP(t) - .005QM(t) + 1.430TM(t)$$
$$(-9.23) \quad (5.94) \quad (-0.81) \quad (-0.66) \quad (2.89)$$

$$IM(t) = 729.1 - 7.184CA(t) - .002IM(t-1) + .068QM(t)$$
$$(2.27) \quad (-1.97) \quad (-4.02) \quad (0.07)$$

$$QM(t) = 2{,}031.9 + 55.076MM(t) - 8.533QM(t-1) + 2.719IM(t) + 23.032IV(t)$$
$$(18.25) \quad (2.97) \quad (-1.41) \quad (2.24) \quad (8.260)$$

U2 for PC(t) = .024

U2 for MM(t) = .281

U2 for IM(t) = .123

U2 for QM(t) = .187

U2 for PM(t) = .695

SHORT RUN ELASTICITIES

	PM(t)	PF(t)	RI(t)	MM(t)	CA(t)
PC(t)	-1.83	0.87	1.43		
QM(t)				0.57	
IM(t)					0.34

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