Macroeconomic, international trade and sectoral policies in livestock development: an analysis with particular reference to low income countries[1]

T O Williams - *International Livestock Research Institute, Semi-Arid Zone Programme, Niamey, Niger*

D A DeRosa and O Badiane - *International Food Policy Research Institute, Washington DC, USA*

Introduction

The livestock sector plays a vital role in the economies of many developing nations. It provides food, income, employment and valuable foreign exchange. In low income countries livestock also serve as a store of wealth, provide draught power and fertilizer for crop production and are a means of transportation. In 1991, livestock products accounted for about 15 per cent of agricultural GDP in developing countries in Southeast Asia [Appendix A contains a list of countries included in each region], 23 per cent in South Asia, 27 per cent in West Asia and North Africa (WANA), 28 per cent in sub-Saharan Africa (SSA), 37 per cent in South America and 43 per cent in Central America (USDA, 1993a). If the value of animal traction, transport and manure were added, the share of agricultural GDP contributed by livestock would be much higher.

Despite the importance of livestock, growth in output has been slow in relation to potential in many developing countries. Between 1979-1981 and 1992, per caput production of livestock and animal products declined by 10 per cent and 14 per cent in WANA and SSA, remained stagnant in Latin America and the Caribbean (LAC) but increased by 65 per cent in Asia (FAO, 1994a). Domestic supply of meat and milk has lagged behind demand in virtually all developing regions. Between the early 1970s and late 1980s, per caput meat consumption increased by 6 per cent in SSA, 32 per cent in LAC, 40 per cent in Asia, and 63 per cent in WANA (FAO, 1991).

Several factors underlie these trends. On the demand side, rapid increases in per caput income (especially in Southeast Asia), urbanization and high income elasticities of demand for livestock products have partly fuelled increases in per caput consumption. On the supply side, low animal productivity, inappropriate technologies, inadequate research and extension support, poor infrastructure and unfavourable external conditions (for example protection in developed countries) contribute to poor performance by the livestock sector. In addition to these factors policy choices by Governments in many developing countries played a significant role in widening the gap between domestic demand and supply.

Historically, governments in both developed and developing countries have intervened in the agricultural sector for political and economic reasons by a variety of instruments and institutional arrangements. In developing countries evidence suggests that macroeconomic and sectoral policies pursued in the past and the institutional instruments used to implement these policies stifled production by creating a pervasive anti-agricultural bias (in SSA) or encouraged inefficient production for the domestic market and reduced incentives for producers to look outward (in LAC and Asia). Some policies simultaneously made imported livestock products more available and affordable than domestically produced equivalents, thus encouraging inappropriate consumption (World Bank, 1981; Krueger *et al,* 1988; Jaeger, 1992; Williams, 1993a).

The economic and production inefficiencies spawned by these policies created structural and macroeconomic imbalances that were considered inimical to economic growth in developing countries. In line with the worldwide trend to reduced state control and intervention in economic activities there have been moves in many developing countries toward liberalization of markets and reform of sectoral, trade, and macroeconomic policies. This new attitude to economic policies and rethinking of the state's role in fostering agricultural development creates an opportunity and a challenge for policy research. Research is needed to assess the achievements of implemented reforms and identify lingering constraints and opportunities to rectify them.

This paper analyzes the implications of macroeconomic, sectoral and trade policies for the livestock sector with a view to

informing the policy debate on development, especially in low income countries. It describes the economic and institutional factors that influence livestock sector growth and the options available to policy makers to improve performance and reviews the impact of past and present policies on the livestock sector.

The focus is on production from ruminant livestock in sub-Saharan Africa, Asia and Latin America, although references are made to West Asia and North Africa and to poultry meat and pork when appropriate. Given the heterogeneity in production systems, institutions, and economic environments, some selectivity has been exercised in discussing policy issues affecting the livestock sector. The paper seeks to identify broad similarities and differences between regions and (where feasible) countries, in order to highlight patterns that form and constrain policy decisions in developing countries.

Trends in developing countries

Production

Livestock production in different regions differs markedly. Differences exist not only in production systems but also in the relative importance and potential for increased production by livestock species. Variations arise due to differences in resource endowment, climate, population, disease incidence, level of economic development, research support and government economic policies. Production trends are also difficult to measure because of the cyclical nature of meat supply. An accurate production measure would include both meat produced by slaughter and change in inventory but the data generally available are based only on slaughter figures. Sole reliance on slaughter figures often creates a bias in trends, particularly for cattle, since slaughter numbers and change in inventory vary inversely during the cattle cycle. Calculations of ruminant production trends are therefore usually sensitive to the choice of the time frame used in a trend analysis.

Ruminants provide the major share of meat produced in Latin America, sub-Saharan Africa and West Asia and North Africa whereas pigs and poultry provide the larger share in Asia (Table 1). Beef accounted for 52 per cent and 50 per cent by weight of total meat production in Latin America and sub-Saharan Africa in 1990-1999 but pork and poultry accounted for 80 per cent of meat production in Asia. In relation to world production, Latin America is an important beef region with 19 per cent of global beef output in 1990-1992. During the same period Asia produced about 42 per cent of world pork output but the four regions considered here accounted for only 23 per cent of global cow milk production.

Asia has shown rapid growth in meat and milk production in the last 10 years in contrast to slow growth in the other developing regions (Table 2). Production of red meat grew by 4.0-6.5 per cent in Asia but by only 1.0-2.8 per cent in LAC, SSA and WANA. Growth in red meat output in SSA and WANA has been below the population growth rates of 3.1 per cent and 2.9 per cent. Across regions, red meat production has grown more slowly than white meat, partly reflecting rapid industrialization of white meat production in many developing countries. Milk production grew at a higher rate than meat production in SSA but milk output expanded less than meat output in the other regions.

Consumption

Livestock output over the past 20 years grew more slowly than demand in many developing countries (Figure 1). Demand for meat, in particular, out-paced domestic supply by a wide margin. In the 1970s and 1980s the Asian region showed fastest growth in meat consumption among developing regions, most of this being in pork and poultry. Per caput increases in income, urbanization and changes in relative meat prices were the main determinants of higher meat consumption. Income has the greatest influence on demand for livestock products, demand increasing with higher incomes up to a certain level, after which it tends to stabilize before it declines at the highest incomes. East Asia and the Middle East show increased consumption accompanying economic growth. This is due to rapid industrialization in East Asia and increasing oil revenues in the Middle East.

Between 1969-1971 and 1986-1988, WANA showed a 63 per cent increase in per caput meat consumption. Reduced incomes cause reduced consumption or a switch to cheaper substitutes. Depressed growth in real incomes in Latin America during the 1980s, for example, caused a shift from beef and pork to cheaper poultry (Jarvis, 1986). A similar switch occurred from imported to local dairy products in several West African countries in the late 1980s (Williams, 1993b).

Table 1 Meat and milk production ('000 tonnes) by geographical region, 1969-1971 to 1990-1992

Product	Region and period							
	Sub-Saharan Africa		Asia		West Asia and North Africa		Latin America	
	1969-1971	1990-1992	1969-1971	1990-1992	1969-1971	1990-1992	1969-1971	1990-1992
Red meat								
Beef	1682	2269	2363	4005	681	1202	6779	9965
Lamb/Mutton	294	403	625	1184	761	1356	389	294
Goat	406	507	690	1626	307	352	87	123
Buffalo	-	-	997	2194	129	192	-	-
Subtotal	2382	3179	4675	9009	1878	3102	7255	10382
White meat								
Poultry	344	859	2367	6778	394	2061	1211	5883
Pork	189	470	11148	29534	18	37	1714	3039

Subtotal	533	1329	13515	36312	412	2098	2925	8922
Total meat	2915	4508	18190	45321	2290	5200	10180	19304
Milk								
Cow	4987	9691	15696	40931	6133	13482	25088	43028
Goat	1034	1633	1221	3534	1427	1997	329	338
Buffalo	-	-	18547	41834	1373	1566	-	-
Total milk	6021	11324	35464	86299	8933	17045	25417	43366

Note: a) Production is defined as slaughter and not slaughter plus change in inventory
Source: Calculated from FAO production yearbooks and data tapes

Table 2 Estimated annual growth rate (per cent) in meat and milk production by geographical region, 1980-1990

Product	Region			
	Sub-Saharan Africa	Asia	West Asia and North Africa	Latin America
Red meat				
Beef	1.4	6.5	2.8	2.5
Lamb/Mutton	1.3	4.0	1.0	0.3
Goat	1.0	5.4	0.7	3.1
White meat				
Poultry	2.4	7.5	6.2	4.8
Pork	4.9	6.0	4.0	2.7
Milk				
Cow	3.8	5.9	1.9	2.1
Goat	4.0	5.0	1.9	-2.1

Source: Estimated from various FAO publications using log-linear least squares regression

Figure 1 Per caput meat and milk production and consumption by geographical region, 1969-1971 to 1986-1988

Table 3 Trade in meat and milk products by geographical region, 1980-1982 to 1990-1992 ('000 m.t.)

Region	Product and period									
	Beef		Mutton and goat meat		Poultry meat		Pork		Dried milk	
	1980-1982	1990-1992	1980-1982	1990-1992	1980-1982	1990-1992	1980-1982	1990-1992	1980-1982	1990-1992
Sub-Saharan Africa										

Exports	38.2	48.5	0.5	2.0	0.2	0.6	0.1	0.0	0.6	2.5
Imports	81.3	105.1	3.7	7.1	39.7	74.6	4.1	11.3	184.0	129.4
Net	-43.1	-57.6	-3.2	-5.1	-39.5	-74.0	-4.0	-11.3	-183.4	-126.9
Asia										
Exports	68.4	182.5	33.7	32.5	74.8	345.7	97.6	325.7	20.6	55.8
Imports	102.1	349.2	37.4	94.0	109.5	400.0	40.8	79.6	484.5	607.3
Net	-33.7	-166.7	-3.7	-61.5	-34.7	-54.3	56.8	246.1	-463.9	-551.5
West Asia and North Africa										
Exports	5.9	18.0	29.2	14.2	24.5	16.0	0.0	0.0	1.6	5.8
Imports	314.0	416.5	268.8	140.6	613.5	441.2	0.2	0.3	358.6	449.2
Net	-308.1	-398.5	-239.6	- 126.4	-589.0	-425.2	-0.2	-0.3	-357.0	-443.4
Latin America										
Exports	501.7	406.8	31.4	27.4	258.7	380.2	1.5	30.7	13.0	33.5
Imports	112.2	268.1	9.4	43.8	129.4	252.7	26.3	72.0	444.6	503.3
Net	389.5	138.7	22.0	-16.4	129.3	127.5	-24.8	-41.3	-431.6	-469.8

Source: Calculated from FAO production yearbooks and data tapes

Trade

Slow domestic growth relative to demand has led to increased imports and reduced exports. For 1990-1992, regional net meat imports in WANA, Asia and SSA were about 950,000, 282,000 and 148,000 tonnes per year (Table 3). In the period 1980-1982 to 1990-1992, Latin American beef exports fell by nearly 30 per cent while pork exports from Asia rose by over 200 per cent. Dry milk powder dominates dairy product trade in developing countries, commercial imports in 1990-1992 being highest in Asia and lowest in SSA, probably due to lack of foreign exchange in SSA and an increasing capacity of some countries in East and Southern Africa to produce the milk needed for domestic consumption.

These statistics conceal a lot of diversity between countries. It is clear, however, that with adequate income growth a huge potential for increased demand exists in developing countries given current low consumption levels, high income elasticities of demand and increased population and urbanization. Slow growth in livestock production in some countries and particularly in SSA is, however, a bottleneck to sector development. This implies that in addition to technical measures required to raise productivity revised policies are needed to create appropriate incentives to spur sector growth.

Importance of macroeconomic, trade and other policies in economic theory

Macroeconomic stability and growth

Economic prospects for animal agriculture in less developed countries are conditioned by the general economic performance impinging on agriculture and the rural sector. Concerns for technology, infrastructure and sectoral policies are frequently foremost in the minds of livestock producers and analysts. Economists, however, point to the equal if not greater importance of economic growth and macroeconomic policies (including trade, finance, and investment policies) to the development prospects of farm and other rural based activities in low income countries. Political economy factors in these countries often militate against the economic interests of rural communities and their often underestimated contribution to national output and economic welfare (Johnson, 1994).

Prudent macroeconomic policies are widely recommended as the basis for an "enabling environment" for growth and broad based gains in economic welfare. These policies include stable monetary growth, open and relatively flexible arrangements for international transactions and sustainable fiscal policies designed especially to avoid excess monetary expansion and not cause inflation.

For livestock, prudent policies assume particular importance given that the subsector involves assets that, analogous to durable manufactures, can be stores of value as well as inputs to production. Meat, milk and dairy products and eggs are also widely regarded as superior goods in consumption - that is, goods that increase in importance in consumption expenditure as household (and national) incomes rise (Mellor and Johnston, 1984). In this last connection, although production and especially consumption of livestock products might be expected to increase as income levels rise with economic development, it should be emphasized that the causality runs principally from economic growth and development on the one hand, to the livestock subsector, on the other. In other words, promotion of animal agriculture cannot usually be advanced beyond the pace of general economic development except where fundamental economic factors enable a country to specialize in animal production and export the bulk of it to markets in higher income countries. Where foreign investment is allowed, some important constraints, such as availability of human capital and advanced production and other technologies, might also be alleviated, furthering the possibilities for development of animal agriculture where other fundamental factors (and economic policies) are favourable.

Policy biases against agriculture from the economywide perspective

Macroeconomic policies

Macroeconomic stability and economic growth are of fundamental importance to advanced as well as less developed countries and to the general performance of most production sectors within countries. In the context of animal agriculture in less developed countries a special concern is that inappropriate monetary and fiscal policies can give rise to a bias against agriculture and its most efficient subsectors. Specifically, disincentives to agricultural production and exports can arise when the pursuit of unsustainable expansionary monetary and fiscal policies result in an overvalued exchange rate, excessive imports and lower exports. The frequent outcome is that new import controls are imposed as foreign exchange reserves fall, "validating" the overvalued exchange rate and reinforcing the import-substitution policies. This outcome also results in the repression of incentives for greater exports of agricultural commodities and products, including livestock, that bulk large in the underlying comparative advantage of many less developed countries.

Protection trade policies

In the economywide perspective linkages among macroeconomic policies, protection and agricultural production and trade in less developed countries are at once complex and straightforward. Trade policies are often considered as macroeconomic policies due to their close relationship with the macroeconomic conditions for equilibrium in international payments balances. They can equally be regarded, however, as complex arrays of sector policies, frequently with the central purpose in low income countries of promoting industrialization or other development objectives, such as increasing export diversification.

Import substitution policies promoting industrial or other subsectors, including non-competitive subsectors of agriculture itself, essentially result in distortions to domestic relative prices that discourage production and greater exports of internationally competitive goods. These are traditional and other goods that use a given country's (relatively) abundant resources most intensively. Agricultural production and exports frequently suffer when protection in developing countries is given to encourage industrial or other production. More generally the disincentives to agriculture will have a negative impact on the rural sector and forestall the greater contribution that robust performance in agriculture and the rural sector can make to economic growth in many less developed countries (Badiane, 1991; 1992).

The circumstances of the livestock and agriculture sector in less developed countries can be considered with reference to production and consumption possibilities in a "small" exporting country (Figure 2). The country produces both manufactures (M) and agricultural goods (A) but its stock of both natural and accumulated primary factors of production - land, labour, and capital (inclusive of human capital, technology and social infrastructure) - is assumed to support greater production of food and other agricultural goods than manufactures over a wide range of possible relative prices. At the given international terms of trade Pa/Pm* the country maximizes its economic welfare by producing at point P* and consuming at a point such as C*. This involves the (balanced) international exchange of the country's excess supply of agricultural goods (exports, Y*Z*) to meet its excess demand for manufactures (imports, X*W*).

High rates of protection for industry, for political economy reasons or to support economic development objectives, are commonplace in developing countries, especially low income countries in Africa and Asia (Finger and Laird, 1987; Erzan *et al,* 1989; DeRosa, 1992). Introducing import substitution policies (in the form of an *ad valorem* tariff on imports of manufactures) results in production and consumption occurring at points such as P and C (Figure 2). The import substitution policy protects local industry and causes domestic terms of trade Pa/Pm to decline, thereby providing the incentive for producing and consuming a greater quantity of domestic manufactures. At the same time, by reducing domestic terms of trade to a point below the international terms of trade for agriculture Pa/Pm*, the policy has the indirect effect of creating a "bias" against production (and exports) in the agricultural sector (Valdés, 1973: Cavallo and Mundlak, 1982; Krueger *et al,* 1988; Bautista and Valdés, 1993) within the framework of somewhat more sophisticated analytical models that incorporate consideration for the non-traded goods sector.

Figure 2 Equilibrium under free trade and protection
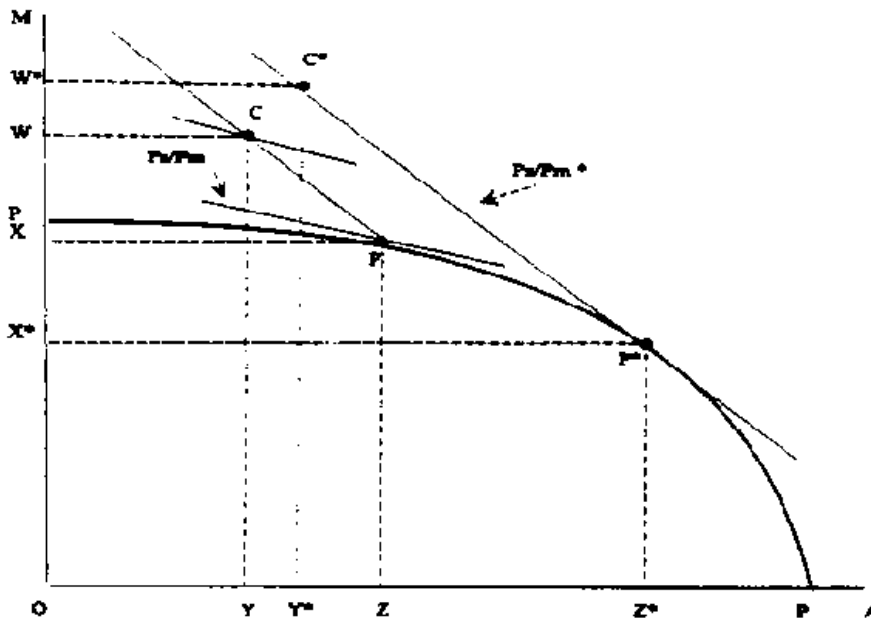
The foregoing analysis is highly stylized. To incorporate animal agriculture explicitly a multi-sector framework such as might be provided by a computable general equilibrium (CGE) model would be required as well as greater consideration of natural resource endowments and the factor requirements for producing animal products. In the mainly heuristic terms pursued here however, what is at issue is whether the livestock sector conforms more to the profile of the "disprotected" agriculture sector or more to that of the protected industrial sector previously described.

Animal agriculture is widely considered to have attractive attributes. It is widely practiced, at least informally, and offers a natural path for commercialization of farm activities in rural areas, even by low income households. Some animal operations, such as dairying and fattening, can be more labour-using (and land-saving) than other farm activities and on an expanded commercial basis require substantial inputs from other agricultural subsectors, especially feed grains. In regions of South Asia with limited arable land greater livestock production might thus efficiently absorb "under-used" labour and increase demand for "inferior" food grains, such as sorghum and maize. Processing of livestock products could absorb further labour but might need capital or technology inputs whose (relative) availability in developing countries is more problematic, especially where foreign investment by multinational or other foreign enterprises is prohibited or highly restricted.

From a normative in addition to the pursuit of prudent monetary and fiscal policies, the first-best remedy for overcoming the disprotection of livestock and other efficient subsectors of agriculture in low income countries is the reduction of protection for industrial and other sectors having little or no international comparative advantage. Such liberalization of trade policies also increases integration with the world economy, in effect allowing world relative prices for agricultural commodities to prevail in the domestic economies of low income countries. It should also be expected to provide such countries with greater benefits from multilateral agreements to liberalize world trade in agriculture, such as under the recently concluded Uruguay Round of multilateral trade negotiations.

Finally, in the real world of second-best policy options, it is frequently suggested that more sector specific improvements to regulatory regimes and infrastructure are to be preferred over macroeconomic and trade policy reforms. This is an area needing more analysis. Recent studies nonetheless indicate that, while inherently desirable, sector-specific policy reforms have limited capacity to overcome biases against agricultural subsectors as long as economic distortions related to macroeconomic and trade policies remain in force (Krueger *et al,* 1988; 1991).

Regional integration

Consequent on the overlong Uruguay Round meetings, renewed interest in preferential trading arrangements, mainly in the form of "free" trade areas, has surfaced in a number of developing regions (Table 4). The implications of such arrangements can be sketched using the analytical framework that has already been described (Figure 2).

Table 4 Organizations for economic cooperation in developing regions

Region	Organization and member countries
Sub-Saharan Africa	Central African Customs and Economic Union (UDEAC): Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon
	Common Market for Eastern and Southern Africa (COMESA): Angola, Burundi, Comoros Djibouti, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Somalia, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe
	Economic Community of West African States (ECOWAS): Benin, Burkina, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo

	Southern African Development Community (SADC) Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe
	Southern African Customs Union (SACU): Botswana, Lesotho, Namibia, South Africa, Swaziland
Asia	Asia Pacific Economic Cooperation (APEC): Australia, Brunei, Canada, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, United States, Taiwan, Thailand
	Association of Southeast Asian Nations (ASEAN): Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand
	South Asian Association for Regional Cooperation (SAARC): Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
Latin America and Caribbean	Andean Common Market (ANCOM): Bolivia, Colombia, Ecuador, Peru, Venezuela
	Caribbean Community (CARICOM): Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St Kitts-Nevis, St Lucia, St Vincent, Trinidad and Tobago
	Central American Common Market (CACM): Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
	Latin American Integration Association (LAIA): Argentina, Bolivia, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, Venezuela
	Southern Cone Common Market (MERCOSUR): Argentina, Brazil, Paraguay, Uruguay
Middle East	Cooperative Council for the Arab States of the Gulf (GCC): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
	Council of Arab Economic Unity (CAEC): Egypt, Iraq, Jordan, Kuwait, Libya, Mauritania, Somalia, Sudan, Syria, United Arab Emirates, Yemen Arab Republic, Yemen PDR
	Economic Cooperation Organization (ECO): Iran, Pakistan, Turkey

A trading arrangement can be formed in which one country (Figure 2) forms a free trade area with another country from the same region (Figure 3). Production possibilities of the second country are represented by the **PP** curve, which portrays the second country as nearly identical to the first in terms of relative resource endowments. The production possibilities of the two countries differ in scale, however, reflecting an underlying difference in the absolute size of their respective endowments of primary factors of production. Like the first country, the second is assumed to forgo production at the free trade point **P*** and to enforce import restrictions that promote greater domestic production of manufactures. Equilibrium production under protection thus occurs at point **P** at the domestic terms of trade **Pa/Pm,** which are lower than the international terms of trade Pa/Pm*.

Figure 3 Equilibrium under a regional trading arrangement
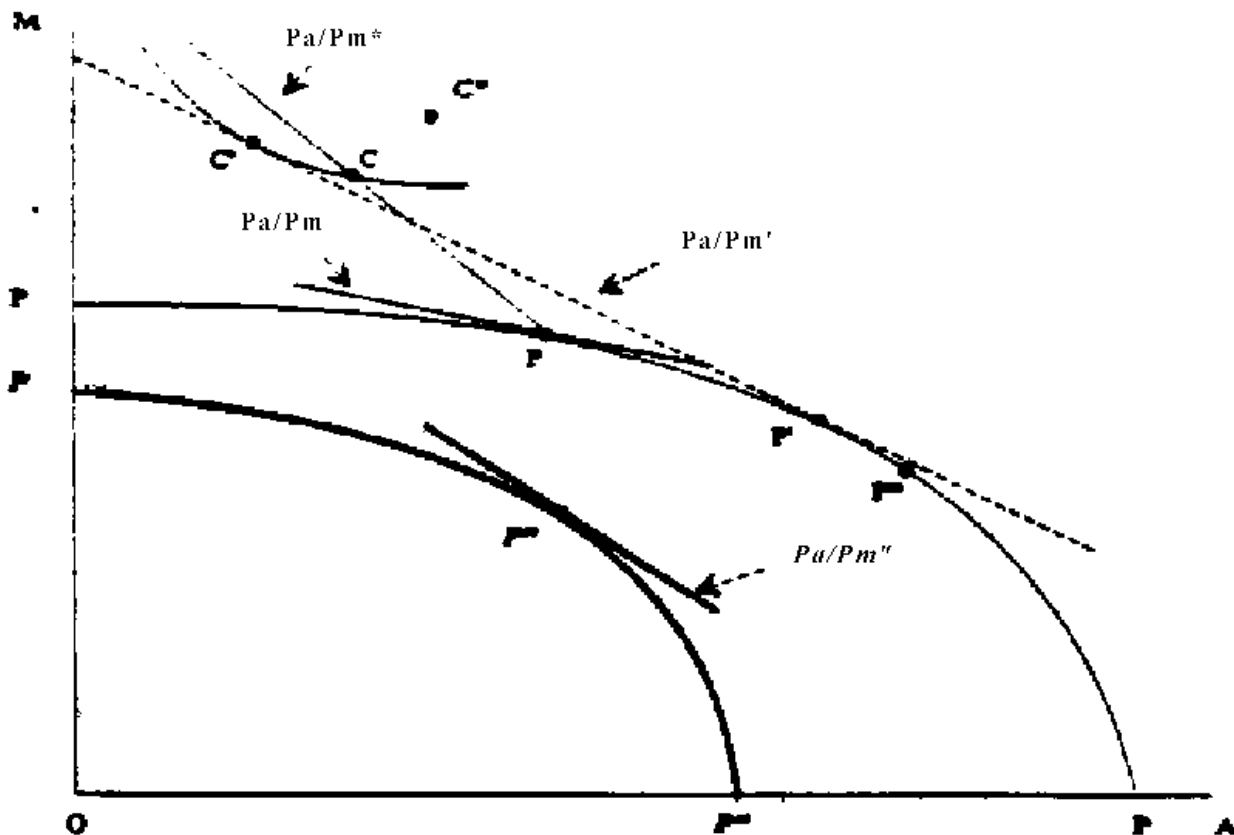
The terms of trade governing production and consumption in the first and second countries, Pa/Pm and **Pa/Pm,** are not

necessarily the same. Their relative magnitudes depend principally on the restrictiveness of the trade measures enforced in the first versus the second country. If protection levels are the same in both countries relative prices will be the same and there will be no incentive for intraregional trade. If, however, the first country maintains a higher (lower) level of protection than the second, the relative price of agricultural goods will be lower (higher) in the first than the second country and there will be incentive for trade between the two either officially or unofficially. Specifically, the first country will tend to exchange exports of agricultural goods (manufactures) for imports of manufactures (agricultural goods) as $Pa/Pm < (>)$ **Pa/Pm**.

Under a free trade arrangement between the two countries trade with third countries (i.e. countries outside the regional trading bloc) would be diverted to a greater or lesser degree. Assuming no barriers to trade except political ones the domestic terms of trade in the two countries would converge to a level between Pa/Pm and **Pa/Pm** in order to accommodate the adjustment of production, consumption, and trade. Economic welfare in the two countries, would not necessarily be improved. The well being of the first country is not improved unless the intrabloc terms of trade are greater than Pa/Pm' (Figure 3), in which case the new equilibrium point for production would lie between P' and P* and the new equilibrium point for consumption would occur at a higher level of (national) economic welfare than that corresponding to point C.

These results demonstrate the fundamental importance of the complementarily of relative factor endowments and hence differences in comparative advantage among countries forming a preferential trading arrangement. If the first country allies itself with one or more countries that have relative factor endowments very similar to its own - i.e. other agricultural exporting countries - the intrabloc terms of trade are unlikely to exceed Pa/Pm' appreciably. Only if the alliance is one in which the member countries are marked by considerable complementarity of natural and accumulated factor endowments would the regional trading arrangement be likely to result in a significant reduction in the bias against agricultural production and trade and to yield an appreciable improvement in economic welfare. This is ironical because in such circumstances members of the trading alliance would be more likely to enjoy terms of trade approximating those available to them under free trade - i.e. $Pa/Pm*$.

In addition, the expansion of production and trade in agriculture is principally in the domain of the first country. Given initial relative prices in the two countries under protection, the first will expand production and exports of agricultural goods but the second will specialize further in the production and export of manufactures. Though both countries might thus have an underlying comparative advantage in agriculture from a world vantage the preferential trading area in fact contributes to overcoming the bias against agriculture only in the first country although the regional trading arrangement might improve economic welfare in both countries.

Extension of these results to production and trade in livestock products is not entirely straightforward. In broad terms regionalism might offer less developed countries an opportunity to expand mutual economic interests through preferential trading arrangements covering livestock products as well as other agricultural goods and manufactures. Fully articulating animal and other agricultural subsectors and greater opportunities for specialization and trade would clearly be introduced within a multisector framework. Nonetheless, the benefits of regional trade liberalization would still be more limited than those available to the countries under general trade liberalization. Further regional economic cooperation should not be expected to promote livestock production and exports widely in the region as long as resource endowment profiles among regional trading partners are similar.

Foreign trade barriers and structural impediments

Notwithstanding the insights from this simple analytical framework (Figure 2, Figure 3) recent research and pragmatic discussions of regionalism have both pointed to some substantive reasons why regional trading arrangements among developing countries might be given greater consideration.

First, the appreciable weakness of the international terms of trade facing exports from many developing countries (for example due to increased protectionism in the major industrial countries or, in the case of some commodity-exporting developing countries, the "dumping" of meat, dairy and other agricultural surpluses on world markets by industrial countries) sustains the view that greater integration with the world economy offers no clear advantages to less developed countries. As emphasized elsewhere (Wonnacott and Wonnacott, 1981: 1992), at the margin foreign protection and its contribution to unfavourable terms of trade for developing (or other) countries in the world economy make membership in regional trading arrangements more attractive by lowering the critical terms of trade Pa/Pm' (Figure 3) [high transport costs for shipments of exports or imports would have implications similar to those for high foreign rates of protection: on the importance of international transportation costs for sub-Saharan African countries, see Yeats, 1990]. Progress in liberalizing world trade in agriculture, following the Uruguay Round outcome, would be expected to make regional trading agreements less attractive by raising the critical terms of trade. Early analyses suggest that little was achieved by way of measurable short or long term improvements to the international terms of trade of livestock or other agricultural products (FAO, 1994; Ingco, 1994; Hathaway and Ingco, 1995).

Among other considerations shortcomings in both physical and institutional components of the infrastructure surrounding agriculture in developing countries could have major implications on the desirability of seeking regional trading arrangements.

Indeed, as documented in studies of structural impediments to greater agricultural productivity, the components of infrastructure surrounding agriculture are often seriously deficient in low income developing countries (Lele, 1991). This relates to transport and communications networks, rural credit markets, organization and regulation of agricultural input and output markets and legal or informal arrangements surrounding the tenure and property rights of individual economic agents over agricultural lands, waterways and irrigation systems.

As an example, poor rural transport or marketing networks in the second of two otherwise similar neighbouring countries (both pursuing import-substitution policies) would be expected to impair economic incentives for agricultural production in the second country, in effect foreshortening the production possibilities curve **PP''** along the agricultural output axis (Figure 3). This would give rise to more sharply divergent relative prices in the two economies than depicted. Whether the creation of a free trade area would result in greater intraregional trade would depend, however, on the precise inadequacies of the infrastructure serving the rural economy of the second country. This would affect, in particular, how they might contribute under liberal trading arrangements to making intraregional trade more attractive to economic agents than wider international trade.

If, for example, overland routes from areas of surplus livestock or other agricultural production to markets in neighbouring countries are shorter or more passable than (say) main routes to port facilities for overseas trade, or if intraregional trade is not required to pass through a parastatal marketing system, then the free trade area would result in expansion of intrabloc trade and tend to eliminate the differences in the relative price of agricultural goods between the two countries. In other circumstances creation of a preferential trading area might lead to little appreciable expansion of trade or adjustment in domestic relative prices without simultaneous elimination of underlying structural impediments.

Macroeconomic policies, trade regimes and livestock development in developing countries

Macroeconomic policies

A "core sample" of 16 low income and other developing countries (Table 5) provides an overview of macroeconomic performance, agricultural and livestock production growth and monetary and fiscal policies during the 1970s and 1980s in six subregions of Asia, Latin America and sub-Saharan Africa. Indicators of macroeconomic performance include economic growth, inflation, and change in the inflation adjusted or real exchange rate. Those illuminating the progress of agriculture and livestock (meat only) comprise the real growth of production and exports. Indicators of macroeonomic policies are confined to the two variables of monetary growth and government expenditure relative to GDP. These indicators are far from comprehensive and, taken individually, are subject to a number of shortcomings including the reliability of the data that underlie their measurement. It should also be noted that statistics by region are based on representative but very limited samples of the countries in the six subregions.

Table 5 Economic performance, agricultural growth, and macroeconomic policies (all average annual percentage rates) by developing regions, 1970-1990

Item	Region (countries) and period											
	Southeast Asia (Indonesia, Malaysia, Philippines)		South Asia (Bangladesh India)		Central America (Guatemala, Honduras, Mexico)		South America (Argentina, Brazil, Venezuela)		Eastern/Southern Africa (Kenya, Zimbabwe)		West Africa (Côte d'Ivoire, Mali, Nigeria)	
	1970-1980	1980-1990	1970-1980	1980-1990	1970-1980	1980-1990	1970-1980	1980-1990	1970-1980	1980-1990	1970-1980	1980-1990
Macroeconomic performance												
GDP growth	7.00	3.89	1.85	5.00	6.02	1.51	4.71	1.18	4.12	3.54	5.42	1.45
Per caput GNP (US $)[a]	930	1207	195	280	1360	1327	2700	2547	565	505	783	437
Export growth	5.55	5.91	2.30	6.46	7.56	0.95	1.51	2.14	0.36	1.38	4.31	3.66
Inflation	12.95	8.50	14.08	9.53	11.92	31.35	58.78	232.98	10.50	12.43	13.08	10.24
Real exchange rate change[b]	-3.49	5.29	1.90	2.68	-1.13	4.42	-1.49	5.47	-2.16	4.26	-6.7	5.61
Agricultural performance												
Agricultural production	4.35	2.67	1.20	2.93	2.70	1.88	3.37	2.22	2.68	2.87	2.27	1.66
Agricultural exports	-0.17	-0.30	-1.87	1.21	2.85	0.59	-4.88	6.00	-0.01	4.41	-4.23	1.53
Meat production	3.85	7.03	1.66	3.56	3.78	0.54	4.37	1.74	2.66	2.85	5.09	1.68
Meat exports	-18.24	39.44	23.91	2.78	1.39	-1.44	2.28	0.14	-6.74	-3.44	5.13	-8.17
Macroeconomic policies												
Money supply growth	27.33	18.86	18.97	15.85	20.44	30.17	49.87	185.86	19.84	17.25	25.04	9.55
G'ment expenditure/GDP	14.02	15.65	10.83	13.75	9.43	14.52	14.68	19.04	22.91	27.67	10.58	16.42

Notes:
[a] Per caput GNP in 1980 and 1990
[b]

Regional country currencies vis a vis US $

The subregions are about equally divided into middle and low income areas. Middle income countries (GNP > US $ 1000 per caput in 1990) are mainly in Southeast Asia and the Latin American subregions. GDP growth was generally greater than 4.0 per cent per annum during the 1970s except in South Asia where it was just under 3.0 per cent. Inflation and exchange rate changes are remarkably similar across the subregions (Table 5). Inflation was in the range 12.0-15.0 per cent per annum except in South America where it averaged nearly 60.0 per cent. In all subregions the inflation-adjusted exchange rate tended to appreciate during the 1970s with the steepest average rates recorded by West Africa and Southeast Asia. Notwithstanding the trend in real exchange rates export growth was generally positive with highest average rates in Central America and Southeast Asia and lowest rates in South America and Eastern and Southern Africa (Table 5).

In comparison to GDP growth the average growth of agricultural production in the 1970s was generally more modest at 2.0-3.0 per cent annually, except in Southeast Asia where it exceeded 4.0 per cent and South Asia where it was just over 1.0 per cent (Table 5). Average growth of agricultural exports was positive only in Central America. In the other subregions it was strongly negative.

The generally weak performance of agricultural production and exports might be taken as symptomatic of the bias against agriculture in the sample countries, depending on the precise nature of the macroeconomic policy environment of the countries surveyed. It needs to be noted, however, that growth rates of meat production and, to a lesser extent, meat exports were frequently more robust than those of general agricultural production and exports during the 1970s (Table 5), presumably reflecting aggregate economic growth but possibly also protection for the meat subsector from import competition. The data suggest that during this period production of meat in some subregions, especially in Latin America, was oriented towards the domestic market as indicated by the higher average growth rates of production than exports.

The 1980s are often referred to as the "lost decade" for developing countries because of lower rates of economic growth, frequent balance of payments problems and sharp (real) exchange rate adjustments. These economic difficulties are reflected dramatically in the actual decline of per caput income levels between 1980 and 1990 in the Latin American and sub-Saharan Africa subregions (Table 5).

From a macroeconomic policy perspective many developing countries failed to curb their large monetary and fiscal imbalances during the 1980s in response to reduction in monetary growth and increased emphasis on achieving greater economic efficiency and international competitiveness in the USA and other major industrial countries. Indeed, monetary growth and government expenditure (relative to GDP) increased - or were not reduced sufficiently - in several subregions (Table 5). This placed many countries at a considerable disadvantage as economic policies in a world economy dominated by industrial countries shifted gear abruptly and encouraged international flows of financial resources to fund higher rates of investment in the major industrial countries than they had during the 1970s.

The strength of such international economic forces combined with policy adjustments taken reluctantly in many less developed countries during the second half of the 1980s caused real exchange rates to adjust to lower levels in most developing regions during the 1980s. Economic growth matching that during the previous decade could not be achieved in the developing subregions except for South Asia, which increased its average rate of GDP growth from 2.9 per cent to 5.0 per cent. Aggregate growth of exports, on the other hand, improved appreciably in several areas. This included South America where, in association with the sharp average depreciation of the real exchange rate (5.5 per cent), it increased from 1.5 per cent to 2.1 per cent per annum. Improved export performance, except in South Asia and Central America, was "led" by improved growth of agricultural exports.

Growth rates of agricultural production and exports fell in Southeast Asia while growth rates of meat production rose relative to the previous decade. Agricultural exports rose sharply in both South America and West Africa but average growth rates of agricultural production, meat production and meat exports fell relative to the previous decade. Against the record of these three subregions, however, two bright spots are seen in the economic performance of South Asia and Eastern/Southern Africa, where growth rates in output and exports of both agricultural products and meat were marginally or substantially higher than during the 1970s.

In summary, the 1980s witnessed greater disarray rather than added growth and development in agriculture and livestock in most developing regions. This might be attributed in part to changes in the international macroeconomic environment but failure by many developing countries to adopt more prudent macroeconomic policies under the changed international conditions are also an important factor. This lends weak support to the view that such policies in the domain of developing countries themselves are vitally important to achieving robust growth in the most internationally competitive subsectors of agriculture in less developed countries.

Relationships between macroeconomic policies and agriculture sector performance, especially the livestock sector, are complex and not easily captured by simple statistics. In addition, trade and sectoral policies should be factored into the analysis. An overriding issue with respect to this discussion of macroeconomic policies, however, is the continuing uncertain progress of policy reforms in many low income and other developing countries, as typified by a recent financial crisis in Mexico. Possibly of greater consequence, however, is the uncertain progress and sustainability of reforms being undertaken by developing countries elsewhere, especially in South Asia and sub-Saharan Africa. The experience of developing countries in several subregions during the 1990s with regard to macroeconomic policies and performance will determine the epitaph of the 1990s

**Trade policies**

World trading environment

The global trading system is dominated by the major industrial countries. Expanding trade relations around the Asia-Pacific Rim - an especially dynamic region of the world economy that includes the fast-growing and outward oriented (newly) industrialized countries (NICs) of East and Southeast Asia - have, however, become a major factor in the growth of world trade during the last 10 or more years. The importance of the major industrial countries to the global trading system extends particularly to international trade in agriculture, which occupied a prominent place in the Uruguay Round of mutilateral trade negotiations.

With respect to livestock, international trade in meat and dairy products takes place in a relatively small residual market and the volume traded accounts for a very small proportion of world production. Excluding trade among EU member countries, only about 10 per cent of global beef output, 5 per cent of dairy, 3 per cent of pork and 8 per cent of poultry were traded internationally in 1991 (World Bank, 1993) but even adding trade in the EU raises the percentage only slightly. Over 70 per cent of international trade in dairy products is through the KU, New Zealand and the United States. The EU is the largest beef exporter, accounting for about 26 per cent of world exports in 1991 with Australia contributing another 21 per cent. Some of these countries are also major importers, the USA taking 31 per cent of world beef imports in 1991, the EU 12 per cent and Japan 15 per cent. In an environment dominated by a few market participants world price movements and expectations are largely determined by the domestic meat and dairy policies of the key producing countries.

Concerns for food security and the secular trend of declining importance of agriculture in national output in developed countries have caused agricultural producer support policies to flourish (Figure 4). These are enforced by import controls as well as direct market interventions to maintain high prices for domestic farmers. These policies impose high and increasingly transparent costs on consumers and taxpayers. In the context of global trade relations they have also come to have important spill over effects on efficient producers in other countries, including less developed countries. The agricultural price raising policies of the major industrial countries succeeded in inducing over production in many EU countries and the USA. This has weakened world prices for meat, poultry and dairy products (and other agricultural commodities) indirectly via the effects of import controls and directly by dumping of excess government commodity stocks and officially subsidized exports -butter exported from the EU in 1994 needed a subsidy of almost US $ 2000/tonne and non-fat dried milk a subsidy of almost US $ 1000.

The world fresh meat trade is also faced with non-tariff barriers based on health restrictions. The EU bans meat produced with growth hormones but the most important restrictions are those on meat imports from countries where there is foot and mouth disease. Combined with domestic farm and livestock support policies the restrictions promote segmentation of world markets for livestock and lead to exclusion of most developing country exporters from the lucrative markets of industrialized countries.

Figure 4 Protection of the livestock sector (PSEs) in major exporting countries (Source: USDA, 1994)
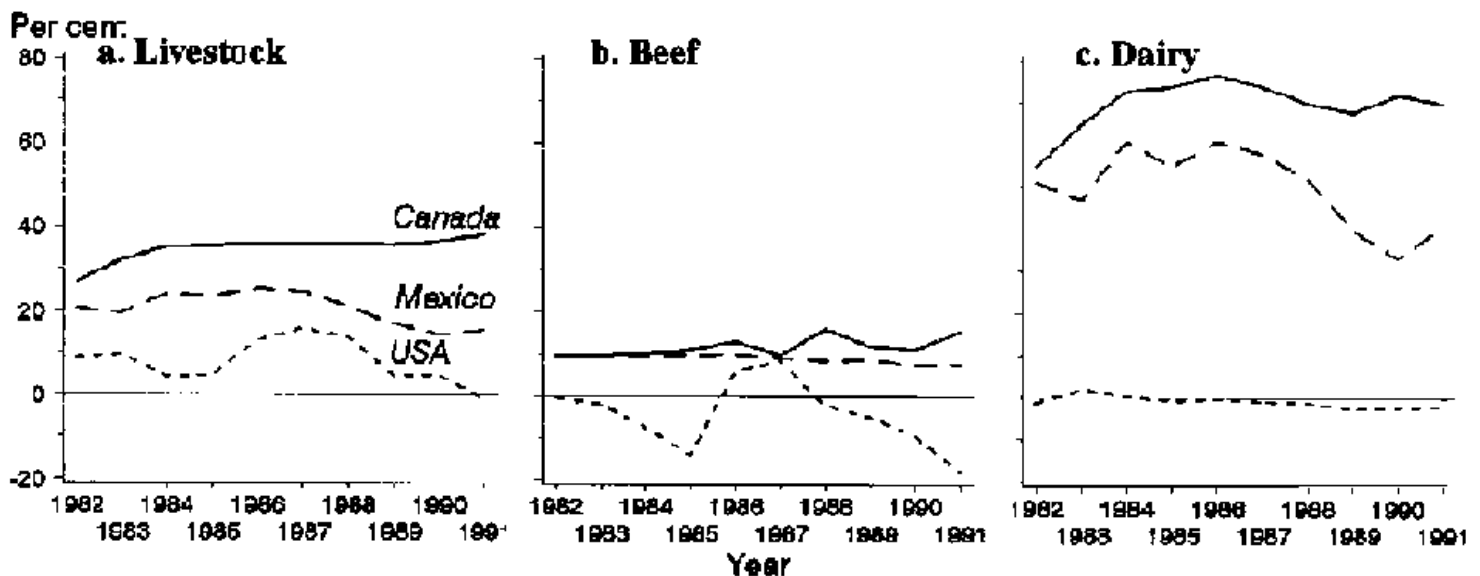
Trade in processed meat and dairy products is not exempt from these difficulties. Few developing countries now export processed meat. Expansion of exports of higher value added meat and dairy products is, however, one way of overcoming barriers to the fresh meat trade and raising foreign exchange earnings. Protection of food processing industries in developed countries has its own peculiar features. In addition to tariffs and quantitative restrictions processed products from developing countries face two further barriers: non-tariff ones due to differing health, food safety and environmental standards; and structural ones due to domination of developed country food markets by

oligopolistic firms benefiting from major economies of scale and scope. A review of trade barriers to processed food exports from developing countries (Matthews, 1994) concluded that rising standards in developed countries will make it more difficult for developing countries to gain access and thus compete in terms of scale economies and product quality.

The Uruguay Round

The Uruguay Round was historic because negotiations to liberalize world agricultural trade were on the agenda. The industrial countries have made dramatic advances in liberalizing trade in manufactures in periodic rounds of negotiations of the General Agreement on Tariffs and Trade (GATT). Until the advent of the Uruguay Round, however, agriculture was largely outside efforts to expand international trade under GATT principles. The Round sought to curb, if not eliminate, protectionist policies. Drawn out over seven years, negotiations on agriculture proved to be very difficult and were not concluded until December 1993, after special bilateral understandings were reached between the EU and the USA. The agreement on agriculture concerns three principal areas: market access; domestic support policies: and export competition.

Market access

The major triumph is tariffication of all non-tarff barriers and the stipulation of an average 36 per cent reduction of bound tariff rates over the 6-year period of the agreement. Rules established for tariffication are not precise and, as a consequence, high rates of tariff protection are expected to be bound by many countries. Circumventing this problem in part is the additional requirement that minimum access be guaranteed for previously restricted import categories amounting to three per cent of domestic consumption initially and five per cent at the end of the implementation period (ironically, this requirement promotes establishment of tariff-rate quota systems in direct contradiction of basic GATT principles).

Domestic support policies

Domestic subsidies subject to control under the agreement are to be reduced by 20 per cent over the agreement period.

Export competition

Expenditure on subsidies and volumes of subsidized exports must be reduced by 36 per cent and 21 per cent over the period of the agreement.

These terms apply mainly to industrial and advanced developing countries. For other developing countries the Uruguay Round agreement on agriculture is less stringent under the rubric of "special and differential treatment" for less developed countries. In the main, the period of adjustment to the new multilateral trading regime in agriculture is extended to 10 years. Subsidies accorded to food and agriculture sectors for "development purposes" are also exempt from coverage. With the exception of tariffication, therefore, requirements for compliance to the terms of the agreement by less developed countries are limited.

Early estimates of the impacts of liberalization of industrial country farm policies based on simulations of multisector partial equilibrium and general equilibrium models (Burniaux *et al* 1990; Page *et al,* 1991) indicate that the total volume of agricultural exports by efficient producers will expand by about 25 per cent. This would be accompanied by an increase in the aggregate level of world prices for agricultural products of 10-15 per cent.

Under the terms of the new agriculture agreement changes in international trade and prices will be considerably smaller. Precise estimates are not available but, *ceteris paribus* the long run expansion of trade in agriculture by efficient exporters in response to greater market access is not expected to be more than 5-10 per cent. The long run increase in world prices for agricultural commodities is not expected to be more than 2-5 per cent in the aggregate and 5-10 per cent for some subgroups, including meat and dairy products as well as wheat (Table 6).

Some commitments were made by the EU and US to reform border measures distorting trade in agriculture (Table 7). Beyond illustrating the observance of the letter of the new trade agreement they reveal some important and disquieting elements. With regard to the tariffication of import barriers it is apparent that tariff rates have been widely bound at initial (1995) levels above the tariff equivalent rates of the pre-Uruguay Round non-tariff barriers.

In the case of milk products, for example, the EU and the USA raised initial protection levels substantially above pre-Round levels. Although the EU commitment implies a 29 per cent reduction in import controls by the year 2000, the end-period rate is actually 18 per cent higher than the pre-Round level. In respect of pledges of reduced volumes of subsidized exports the percentage reductions are inflated by the fact that, by agreement, they are measured relative to the average levels of 1986-1990 rather than the higher volumes of subsidized exports anticipated to take place in 1995.

Table 6 Simulated long-term effects (per cent) of agricultural trade liberalization on world prices

Commodity	Data source				
	WIDER, 1990	Page *et al,* 1991	FAPRI, 1993	Brandao and Martin 1993	Goldin and Mensbrugghe, 1993
Temperate zone products					
Wheat	7.5	5.0	6.3	6.3	5.9
Coarse grains	3.4[a)]	1.8	2.4	4.4	3.6
Rice	18.3	1.2	4.4	4.2	-1.9

Meat	13.0	5.3	0.5	6.1[f]	4.7[h]
Sugar	10.6	5.0	-	10.2	10.2
Soya beans	0.0	-	4.5	-	-
Soya bean oil	0.1	-	3.8	-	4.1[i]
Dairy products	-	9.3	6.9[e]	10.1	7.2
Tropical products					
Coffee	0.4[b]	0.8	-	0.41	-6.1
Cocoa	0.0[c]	1.0	-	0.14	-4.0
Tea	0.5	-	-	2.34	3.0
Tobacco	0.3[d]	-	-	-	-
Cotton	0.9	-	-	2.23	3.7
Groundnuts	1.5	-	-	4.52[g]	-
Groundnut oil	0.6	-	-	-	4.1[i]
Plant and flowers	-	1.0	-	-	-
Spices	-	0.2	-	-	-

Notes:

a) Simple average of maize and sorghum
b) Beans (0.0 per cent for roasted, 1.4 per cent for extract)
c) Butter
d) Leaves (0.1 per cent for cigarettes, 0.8 per cent for cigars)
e) 0.5 per cent for butter, 0.8 per cent for powder, 1.8 per cent for chocolate
f) Beef, veal and sheep meat (3.1 per cent for other meats)
g) All oilseeds
h) Beef, veal and sheep meat
i) All vegetable oils

Source: FAO, 1994c

Table 7 Uruguay Round commitments by the European Union and United States

Region and product	Type of commitment							
	Import controls (*ad valorem* tariff equivalent, per cent)				Export subsidies (volume of subsidized exports, '000 m.t.[a])			
	1986-1988	1995	2000	Reduction	1986-1990	1995	2000	Reduction
	1	2	3	3-2/2	5	6	7	7-6/5
European Union								
Wheat	106	170.1	108.5	36	17008	19119	13436	34
Coarse grains	133	189.3	121.3	36	12625	12183	9973	17
Rice	153	360.5	230.6	36	184	177	145	17
Sugar	234	297.0	279.0	6	n/a	n/a	n/a	n/a
Beef and veal	96	96.1	86.9	10[b]	1034	1119	817	29
Pork	40	52.9	33.7	32[c]	509	491	402	17
Poultry	40	52.9	33.7	36[c]	368	440	291	40
Dairy	177	288.5	204.8	29[d]	n/a	n/a	n/a	n/a
United States								
Wheat	20	6.0	3.8	36	18382	20328	14522	31
Coarse grains	4	8.3	2.1	74	1975	1906	1561	17
Rice	1	5.2	3.3	36	49	272	39	476
Sugar	131	197.3	167.6	15	n/a	n/a	n/a	n/a
Beef and veal	3	30.6	26.0	15[b]	n/a	n/a	n/a	n/a
Pork	6	4.2	2.7	36[c]	n/a	n/a	n/a	n/a
Poultry	6	4.2	2.7	36[c]	35	34	28	17
Dairy	132	143.7	122.1	15[d]	n/a	n/a	n/a	n/a

Notes:

a) Last column expressed in per cent

b) Meat
c) Other meat
d) Milk

Source: Hathaway and Ingco, 1995

These disquieting elements of the GATT agreement, together with lowered expectations about quantitative estimates of the more general effects on international trade and prices of agricultural commodities, may be disappointing. Many agricultural and trade policy analysts, however, point to the success of the Uruguay Round in finally bringing agriculture into greater conformity with the basic principles of GATT and to the potential of future multilateral trade negotiations for achieving greater liberalization of trade in agriculture (Josling *et al,* 1994; Sanderson 1994). Against this view must be weighed that of critics who point to the unabated strength of administered arrangements in agriculture left in place by the Uruguay Round agreement and the creation of new administered arrangements in the tariff-rate quotas mandated under the market access provisions of the new agreement. To these critics, future negotiations to liberalize trade in agriculture will continue to be hindered by the still effective political consensus in favour of agricultural support programmes in the major industrial countries.

Protection in developing countries

The outcome of the Uruguay Round negotiations leaves room to doubt that appreciable expansion of international trade in animal products or other farm products will occur in the near future, at least directly in relation to the multilateral agreement on agriculture. Indirectly it is possible that world demand for agricultural goods might be increased through opportunities for expanded trade in textiles and other manufactures, or even services, made possible by the larger agreement.

This leaves for greater consideration the trade regimes of developing countries themselves especially those seeking to expand exports of livestock and animal products as well as other traditional and non-traditional agricultural commodities and goods (Table 8). The portrait is, however, deficient in several respects. First, regional summaries reflect the circumstances of the core countries and not of all countries in each region. Second, summaries of non-tariff barriers do not include consideration of foreign exchange restrictions which are vital to understanding the breadth of barriers to trade (including animal disease and other health and sanitary regulations that are sometimes enforced in a discriminatory manner against imports) in many African and other low income countries. Third, the data are incomplete with respect to trade in categories other than animal products, cereals and total trade owing to deficiencies in the underlying data sources. Notwithstanding these limitations, some aspects of the data are noteworthy for their possible implications for livestock development across the six subregions.

Judging principally by the height of national tariff walls the most protected economies are those in South Asia and South America whereas the least protected are Central America and Southeast Asia. African economies fall somewhere in the middle with average tariff rates on imports of manufactures as well as primary commodities falling in the range 25-33 per cent. With regard to livestock and animal products it is notable that tariff escalation occurs widely across regions with meat, dairy products and eggs generally facing substantially higher applied tariff rates than livestock. In addition, not unlike the circumstance surrounding imports of cereals and cereal preparations, restrictions on imports of animal products are frequently enforced by non-tariff barriers, including state trading monopolies as well as various forms of quantitative restrictions. In economic terms such restrictions are especially costly because, unlike *(ad valorem)* tariffs, they interfere with the efficiency of the price system in allocating resources as well as goods in consumption and production.

The height of the barriers against imports of animal products suggests that consumers in developing regions bear higher than necessary economic costs in meeting their demands for these products. In other words, lower import barriers - especially to imports of higher value meat, dairy and poultry products - would tend to lower costs of these food items to consumers. They would also, of course, expand opportunities for greater trade to producers of these commodities in other developing countries as well as in the major industrial countries.

Consistent with the earlier discussion of economic theory the possible bias against greater production and trade in livestock and agriculture in general can be related to the higher rates of protection for manufactures than for livestock and agricultural raw materials. Essentially, import substitution policies favouring industrial activities (but also possibly some staple food sectors such as cereals) limit economic incentives for greater specialization in the agricultural activities for which less developed countries (and subregions) have a strong underlying comparative advantage. It could be argued that countries in several of the subregions might enjoy greater output and exports of livestock and related products under more liberal trade policy regimes. Possibilities for such expanded production and exports include livestock in Southeast Asia and Central America, meat products in South Asia, South America and Eastern/Southern Africa and dairy products and eggs in Southeast Asia and South America.

Finally, with regard to regional trade relations, the data clearly show that the strongest trading ties of the six subregions in livestock and animal products are with the major industrial countries, especially with respect to imports. In the case of exports, livestock and meat exports from Central America are also destined mainly for markets in the more advanced countries. This leaves exports of dairy products and eggs and, to a lesser extent, livestock as the animal subsectors in which trade is conducted relatively extensively with other developing countries, presumably mainly on an intraregional basis given the high transport costs for livestock and the perishability of dairy products and eggs.

Table 8 Import restrictions and trade in livestock and animal products by developing regions, 1985

Region tariffs and trade[a]	Product type						Manufactures	All goods
	Primary products							
	All	Live animals	Meat	Dairy products, eggs	Cereals	Agricultural raw materials		
Southeast Asia (Indonesia, Malaysia, Philippines)								
Tariffs and paratariffs	18.4	12.8	23.9	19.5	18.2	15.1	23.0	21.8
Non-tariff barriers	14.8	66.7	64.9	42.8	62.2	42.0	47.5	47.8
Imports, total		29.3	86.8	244.4	1014.8			27927.0
LDCs		8.2	30.5	5.0	407.0			10265.0
Exports, total		26.7	15.8	23.3	56.4			38619.0
LDCs		26.6	7.1	21.8	35.8			12331.0
South Asia (Bangladesh, India)								
Tariffs and paratariffs	100.2	74.8	150.0	72.1	54.9	87.6	122.8	116.3
Non-tariff barriers	73.4	91.7	100.0	92.7	95.9	88.8	61.7	65.1
Imports, total		7.8	1.1	120.6	490.5			18855.0
LDCs		6.7	0.1	22.6	243.0			6964.0
Exports, total		16.4	39.7	2.0	35.3			9264.0
LDCs		16.4	22.0	2.0	13.4			2519.0
Central America (Guatemala, Mexico)								
Tariffs and paratariffs	17.2	12.3	25.5	18.8	19.3	10.5	20.3	19.5
Non-tariff barriers	13.9	2.8	7.2	26.0	49.3	9.4	8.2	10.1
Imports, total		166.2	132.5	174.4	706.6			14825.0
LDCs		3.2	13.4	3.6	122.3			1353.0
Exports, total		155.0	37.7	2.3	20.1			23218.0
LDCs		11.1	10.0	2.2	6.7			2523.0
South America (Argentina, Brazil, Venezuela)								
Tariffs and paratariffs	45.7	31.8	47.0	59.9	49.7	47.3	53.2	50.5
Non-tariff barriers	24.3	20.0	26.6	64.8	23.1	12.9	41.9	37.1
Imports, total		35.2	51.9	108.0	1598.6			25453.0
LDCs		4.0	38.6	15.8	378.2			10298.0
Exports, total		6.3	1230.5	21.5	2307.4			48220.0
LDCs		3.1	435.7	5.7	842.5			14121.0
Eastern/Southern Africa (Kenya, Zimbabwe)								
Tariffs and paratariffs	30.2	10.5	36.3	38.4	29.9	28.7	33.9	32.9
Non-tariff barriers	37.3	50.0	57.2	80.6	58.4	26.7	33.8	34.9
Imports, total		0.4	0.2	4.9	156.3			2330.0
LDCs		0.0	0.1	0.0	65.4			872.0
Exports, total		0.2	31.7	0.1	23.6			1914.0
LDCs		0.0	3.0	0.1	5.8			724.0
West Africa (Côte d'Ivoire, Nigeria)								
Tariffs and paratariffs	22.6	12.8	29.0	27.1	25.1	15.7	25.2	24.6
Non-tariff barriers	16.7	5.6	42.9	33.1	41.1	6.7	10.0	11.8
Imports, total		5.7	15.7	121.5	450.8			7916.0
LDCs		0.4	1.7	0.8	64.4			1603.0
Exports, total		0.0	0.3	0.7	11.9			16048.0
LDCs		0.0	0.0	0.6	11.9			2321.0

Notes: a) Tariff and paratariff values are *ad valorem* rate (per cent) of tariffs plus import surcharges, import surtaxes and other fiscal charges levied on imports; non-tariff barriers are frequency (per cent) of national tariff lines so affected; imports and exports are millions of US $

Source: UNCTAD, 1989

In the context of regional cooperation and possibilities for expanding intraregional trade in livestock and animal products an attractive option for regional policy makers would be the introduction of preferential tariff rates for intraregional exports of dairy products and eggs. This would be encouraged by regional producers recognizing their mutual interests in cooperative trade policies to promote exports to neighbouring countries at the (seeming) expense of exports from outside the region. Indeed, this policy option runs parallel to the focus of many regional trading arrangements among less developed countries on expanding intraregional trade in manufactures. From the economywide perspective, however, the extent to which preferential trading to promote intrabloc trade in industrial or other nontraditional sectors relieves

constraints on the scarcest resources and enables greater aggregate consumption to be achieved is of primary importance for economic welfare. In these terms, policies to expand intrabloc trade in sectors for which the region may have limited international comparative advantage are not likely to yield appreciable gains in economic welfare except to the regional producers whose economic interests are principally served by the preferential trading arrangements. Notwithstanding distortions in the global trading system that adversely affect the less developed countries, the second-best policy option, as well as the first-best, for the national economies of developing countries and those subsectors of agriculture that are most internationally competitive is likely to be general liberalization of trade with countries outside and within the same region on a nondiscriminatory basis.

Livestock sector policies

In addition to the economywide policies already discussed direct livestock sector specific interventions in developing countries are common and take many different forms. Traditional methods of intervention in the livestock sector include the use of price controls and state monopoly marketing boards, restraints on private sector involvement in processing and marketing and an array of inhibitory measures such as export taxes, import tariffs, export and import licenses, quotas and bans. These intervention policies were often implemented with the aim of achieving certain broad objectives including output expansion, export promotion, revenue generation, price stabilization, inflation control and improvement of income distribution. With few exceptions, however (e.g. Operation Flood in India), the evidence suggests that traditional methods of intervention in the livestock sector have failed to achieve their objectives and have, instead, largely benefited consumers at the expense of producers (Jarvis, 1986; Williams, 1993a).

Failure of traditional intervention methods stems in part from the inherent conflicts that often arise between the desired objectives of livestock policy and the instruments required to achieve them. In many LAC and SSA countries, for example, state marketing boards were established in part as instruments of revenue generation and producer support and to control export of livestock products. They functioned as buying and selling agents. At government prompting they often fixed low purchase and selling prices or used export earnings to subsidize and lower the urban retail price of meat and dairy products - thus benefiting consumers and harming producers. In cases where agency domestic selling prices (set by government) were inadequate to cover their handling costs and the costs of purchasing products at the government-guaranteed producer prices, subsidy payments were made by the treasury. In Zimbabwe in 1984 and 1986, for example, the Cold Storage Commission (the parastatal responsible for beef marketing) needed 8.5 million and 6.0 million Zimbabwe dollars to cover trading deficits incurred as a result of government control of both purchase and wholesale selling prices (Williams, 1993a).

There was similar inadequate appreciation of the potential conflict involved in attempting to achieve domestic livestock production objectives through the price mechanism and maintaining external trade balance. The traceable nature of livestock products implies that if stiff tariffs or quotas are imposed on imports to correct trade imbalances created by an overvalued exchange rate they will often have an indirect ill effect on the livestock sector since they were not implemented with the latter in mind.

Previous intervention policies also failed to account for the dynamic behaviour of the livestock sector and the role that other institutional factors such as credit and public infrastructure could play in promoting livestock growth. Large variations in producer prices over the cattle cycle, for example, imply that income would vary significantly were the number of animals slaughtered to be held constant. Slaughter does increase in the short term as prices fall and producers disinvest in livestock. Thus, when prices are falling, unless credit is available or there is a good network of roads and transport system to move animals to regions where prices are stable, producers will often sell more animals than they otherwise would to achieve needed income (Jarvis, 1977; Doran *et al*, 1979; Sapelli, 1984). This extends the time needed to rebuild herds and increase output.

Meat and dairy price controls also failed to curb inflation, and in some cases even exacerbated it, in countries where such measures were implemented. The prices fixed were generally too low in relation to demand and supply. Scarcity of products sold at controlled prices rapidly developed alongside parallel markets with prices higher than would in the absence of price controls. As a result the proportion of goods sold at controlled prices fell while parallel market sales increased, with an inflationary effect. These problems were met in several LAC countries in the late 1970s and in SSA in the early 1980s.

These lapses and structural problems such as poor export performance, increasing import bills and huge parastatal financial losses combine to demonstrate the failure of traditional intervention methods. Since the mid 1970s in LAC and Asia and the 1980s in SSA sectoral and macroeconomic reforms have been implemented in several countries. These have emphasized shifts from administered price setting towards greater use of market determined prices, reduction of the statutory roles of public marketing agencies, devolution of some functions to private sector organizations and removal of restrictions on private sector marketing. Macroeconomic reforms involving trade and exchange rate liberalization and reforms of fiscal, monetary and investment credit policies have also been undertaken.

Evidence of the effects of these reforms on the agricultural sector remains tentative and mixed, partly because of the varying degree of commitment to all aspects of reforms. The evidence is still very scanty for the livestock sector. A recent review of the impact of structural adjustment programmes in SSA showed that macroeconomic reforms have spurred external competitiveness while reduced taxation of agriculture has encouraged production and exports (World Bank, 1994b).

One analysis (Valdés 1993) of the effects of economywide and sectoral reforms in Chile and New Zealand showed the overall impact on agricultural production and exports to be beneficial, particularly in Chile, with moderate efficiency gains

in New Zealand. On the debit side, Chile still faces the challenge of raising the incomes and welfare of small farmers in the marginal areas that have benefited least from reform and in New Zealand continuing protection of domestic industry hurts the agricultural sector. The study also highlighted the importance of trade and macroeconomic policies over sectoral interventions, and in particular the strategic role of the real exchange rate in allowing agriculture to compete domestically and internationally.

Another study of the effects of recent dairy price policy reform in Kenya (Steal and Shapiro, 1994) showed that deregulation reduced the negative protection previously experienced by producers by 20-30 per cent. The continuing existence of entry barriers into milk processing for private investors and the monopsony power of Kenya Cooperative Creameries, however, prevented further gains of price deregulation being passed to producers.

What is clear from the scanty evidence is that earlier expectations of rapid economic transformation as a result of reform implementation were too optimistic. Implementation has been more difficult and time consuming than originally expected and in some cases lacked a coherent framework for initiating and sequencing sectoral and macroeconomic reforms. It is also clear that errors in sequencing and adjusting traditional policy instruments to a partially liberalized policy environment could derail or threaten the gains obtainable from reforms.

Special focus on West Africa

West African countries provide a good illustration of the implications of macroeconomic, international trade and sectoral policies for regional trade in livestock products. The Sahel countries, over many centuries, have been the major source of livestock products, mainly fresh meat, to their coastal neighbours. Three major developments in the 1970s and 1980s fundamentally changed patterns of livestock trade in the region. The first was the severe drought of the late 1960s and early 1970s which opened regional markets to substantial extraregional imports of frozen meat, initially from Argentina and later from the EU. The second was the sustained imbalance in macroeconomic policies in the Sahel countries during the 1970s and 1980s, epitomized by the heavily protectionist trading policies in favour of industry, coupled with substantial and explicit taxation of the agricultural sector and the gradual appreciation of the CFA Franc. The third was the emergence of considerable surpluses in the livestock sector of the EU after decades of heavy subsidies.

Sahel beef exports to coastal West Africa dropped significantly as a consequence of these developments. In Côte d'Ivoire, for example, beef from the Sahel countries by the end of the 1980s had fallen to half of an initial share of over 60 per cent. Imports of frozen beef from countries outside the region, mainly from the EU, jumped 3-fold from a low of 16 per cent to 44 per cent (Delgado and Lent, 1992). The decline in Sahel exports occurred despite nearly complete recovery in the livestock sector from the drought of the 1970s. This indicates a much greater role of sector-specific and trade policies in the Sahel and neighbouring countries as well as livestock production and export policies in the EU. Underlying the changes in relative export shares was a shift in the price ratio between Sahel beef and imports from 0.5 in the early 1980s to 2.0 by 1990, as import prices for EU beef fell to 20 per cent of their initial level. The fall in the price of imported beef reflects increases in subsidies to exports to West Africa which rose from CFA 124/kg in 1974 to CFA 710/kg in 1991 in order to reduce mounting surplus stocks in the EU. It has been estimated that subsidies to European beef have been as high as 7580 per cent (Delgado and Lent, 1992; Afrique Agriculture, 1993).

In addition to the detrimental effects of EU trade policies on regional exports, the latter have been adversely affected by prevailing policies in the Sahel countries, by trade barriers within West Africa and by economic decline in importing coastal countries.

Domestic factors affecting the supply of livestock exports from the Sahel countries include sectoral policies that discourage trade, mainly transport and marketing policies that raise the cost of operating in local and transborder markets and (to a greater extent) the appreciation of the CFA Franc. Because demand for livestock products is strongly elastic macroeconomic policies in importing countries (through their impact on the overall rate of income growth) have major implications for regional trade in livestock products (Badiane, 1994). The 1980s was characterized by a rapid decline in incomes in most of West Africa and meat demand in the two major importing countries, Côte d'Ivoire and Nigeria, fell from 12.2 and 8.4 kg per caput to 11.0 and 4.2 kg.

The implications of domestic supply factors in the Sahel countries and of EU export policies for livestock product trade in West Africa have been highlighted by the reaction of regional trade flows to the devaluation of the CFA Franc and the reduction of export subsidies for EU beef. The sharp decline in EU intervention stocks (Figure 5) made it easy for the EU to reduce subsidies on beef exports by as much as one third (Afrique Agriculture, 1994). This coincided with the devaluation of the CFA Franc by 50 per cent in February 1994. EU beef import prices rose by 50 per cent as a result while Sahel export prices dropped in non-CFA coastal countries or changed only slightly in CFA countries. Exports from the Sahel countries reacted favourably and during the first quarter of 1994 exports from Burkina Faso and Niger were three and two times higher than their respective exports for the whole of 1993 (Afrique Agriculture, 1994).

Figure 5 Levels of European. Union beef intervention stocks (Source: USDA, 1994)
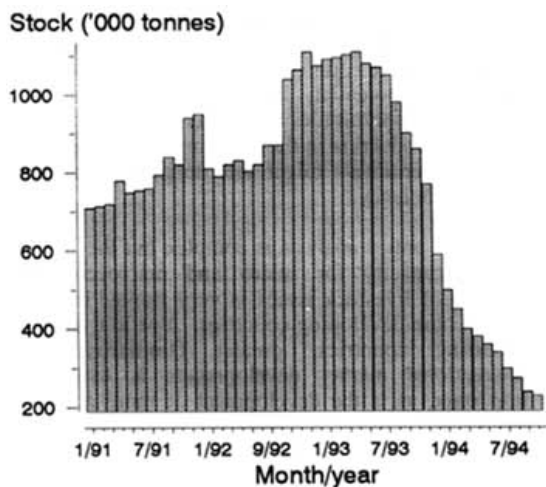
Exports from the EU are now declining rapidly. These encouraging developments may not last for long because demand and inflation pressures are likely to raise Sahel beef prices while recovery in the agricultural sector of Eastern Europe (which has absorbed the bulk of EU surpluses in recent years), the admission of new members to the EU and the probable persistence of very high EU producer prices despite the recent GATT agreement (Figure 6) could lift EU beef stocks to their previous levels.

Figure 6 European Union beef producer prices, 1990-1994 (Source: USDA, 1994)
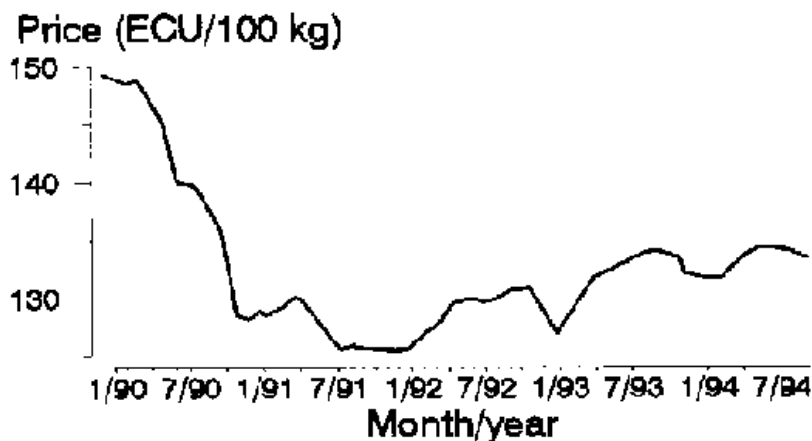
The proposed extension of the milk quota system for a further eight years and improvements in feedlot operations are also projected to result in a general rise in EU beef production up to the late 1990s (World Bank, 1993). Higher Sahel beef prices and potential increases in EU beef export subsidies in order to dispose of the higher stocks can be expected to return regional livestock markets in West Africa to the situation of the 1970s and 1980s.

Conclusions

A broad range of policies affects the livestock sector. This range includes macroeconomic, trade and sectoral policies in addition to public infrastructure, animal health services and investment in processing and marketing facilities. Because services such as infrastructure, communications, research, extension and training are public good and are essential to the overall success of other economic reforms government has a role to play in promoting, or actually providing, these services.

Government policy should promote optimal use of domestic resources in the production of livestock as well as other agricultural commodities and products for both domestic consumption and export. Given the diversity of natural, social, institutional and economic resources and the varying potential for livestock sector growth, desirable livestock policies must differ from country to country. Each country's production potential, consumption profile and marketing opportunities will determine the role of livestock production in the economy and the areas in which governments might seek to promote greater market efficiency.

Livestock policy analysis is complex but the institutional capacity for micro and macroeconomic analysis of livestock issues is very limited in most low income developing countries. For low income exporting countries, greater familiarity with international market developments is especially important, as is the development of more accurate and comprehensive data bases for policy analysis.

International market instability and distorted world prices create major policy dilemmas for developing countries that have

the natural resources to produce livestock at a relatively low cost. Should they resist using world prices in situations where these are primarily the result of distortionary policies in developed countries? Should they import lower cost livestock products on the grounds that they benefit consumers despite their negative impact on producers and long term growth? Or should they protect domestic producers to encourage development of their own livestock sectors and thereby forego the benefits of low import prices?

The answer to the first question is clear. Economic theory suggests that international prices are the best measure of opportunity cost and should determine domestic prices. The argument for using world prices does not depend on how they are determined but only on the fact that they are fixed from the point of view of the country concerned. Three reasons can be given, however, as to why international market price distortions might be of legitimate concern to developing countries (Duncan and Jones, 1993). First, if policy reforms in developed countries lead to reduction or elimination of distortions, current prices might not be a good guide for longer term investment decisions. Second, the reduction of domestic production of products that compete with imports might make a country more vulnerable to future increases in world market prices. Third, importing goods at distorted prices will have an income distribution effect, favouring consumers of the subsidized product and harming producers.

Although these arguments might provide a basis for imposing countervailing duty measures to restrict subsidized imports each country needs to make a critical appraisal of its own situation to arrive at a desirable solution. In this connection careful assessment should be made of the possible extent to which inappropriate domestic macroeconomic, trade and other policies are also important factors in the unsatisfactory performance and contribution to overall economic growth and poverty alleviation of the agricultural sector in general and the livestock subsector in particular.

The processed food sector in developing countries offers additional opportunities for growth of the livestock sector. This is true for the Latin American and Asian countries already heavily involved in the export trade. In the medium term, however, low income countries in the Sahel and other less developed regions might also be able to increase production of dairy and other processed livestock products to meet expanding regional and local demands. Beyond regional markets, formidable barriers to entry remain in the markets of the developed countries. To overcome the obstacles in these markets developing countries need to engage in more frequent negotiations with the major industrial countries for better market access and to seek agreement to be consulted in the setting of food import standards. Developing countries also need to encourage foreign investment in their domestic food industries in order to get the support of the multinational firms that dominate the food markets in developed countries.

In all regions, but most especially in subSaharan Africa, governments have a role to play in ensuring the availability of the infrastructure and support services that producers need in order to be able to respond effectively to price incentives. In addition, governments need to help develop private sector capacity where state marketing boards are -being dismantled and the private sector shows signs of not being able to respond to the new marketing environment.

References

Afrique Agriculture. 1993. Volume 18, Number 208.

Afrique Agriculture. 1994. Volume 19, Number 219.

Badiane O. 1991. Regional agricultural markets and development strategies in West Africa. *Quart J. Int. Agric.* 30: 37-50.

Badiane O. 1992. The role of agriculture and trade in economic development. In: Csaki C, Dams ThJ, Metzger D and van Zyl J (eds) *Agricultural restructuring in Southern Africa.* Association of Agricultural Economists of Namibia: Windhoek, Namibia. 146-162.

Badiane O. 1994. Macroeconomic policies and inter-country trade in West Africa. In: Atsain A, Wangwe S and Drabek G (eds) *Economic policy experience in Africa.* African Economic Research Consortium: Nairobi, Kenya. 321-350.

Bautista R and Valdés A. 1993. *The bias against agriculture.* ICS Press: San Francisco, USA.

Brandao ASP and Martin WJ. 1993. Implications of agricultural trade liberalization for the developing countries. *Agric. Econ.* 8: 313-343.

Burniaux J-M, Martin JP, Felorme F. Lienert I and van der Mensbrugghe D. 1990. Economy-wide effects of agricultural policies in OECD countries: a general equilibrium approach using WALRAS model. In: Goldin I and Knudsen O (eds) *Agricultural trade liberalization: implications for developing countries.* Organization for Economic Trade and Development: Paris, France. 238-306.

Cavallo, D and Mundlak Y. 1982. *Agriculture and economic growth in an open economy: the case of Argentina (Research Report N° 36).* International Food Policy Research Institute: Washington DC, USA.

Delgado C and Lent R. 1992. Coastal demand constraints for Sahelian livestock products: Côte d'Ivoire. Paper presented at the IFPRI/ISRA seminar on "Regional integration of agricultural markets in West Africa", December 2-4 1992, Saly Portudal, Senegal.

DeRosa, Dean A. 1992. Protection and export performance in sub-Saharan Africa. *Weltwirtschaftl. Archiv* 128: 88-124.

Doran MH, Low ARC and Kemp R. 1979. Cattle as a store of wealth in Swaziland: implications for livestock development and overgrazing in eastern and southern Africa. *American J. Agric. Econ.* 61: 41-47.

Duncan A and Jones S. 1993. Agricultural marketing and pricing reform: a review of experience. *World Development* 21: 1495-1514.

Erzan R, Kuwahara H, Marchese S and Vossenaar R. 1989. The profile of protection in developing countries. *UNCTAD Rev.* 1: 29-50.

FAO. 1991. Food balance sheets: 1984-1986 average. Food and Agriculture Organization: Rome, Italy.

FAO. 1994a. *Production year book. Volume 48.* Food and Agriculture Organization: Rome, Italy.

FAO. 1994b. 1994 Country tables: Basic data on the agricultural sector. Economic and Social Policy Department, Food and Agriculture Organization: Rome, Italy.

FAO. 1994c. *Agrostat tapes.* Food and Agriculture Organization: Rome, Italy.

FAPRI. 1993. *FAPRI 1993 world agricultural outlook (Staff Report N° 2-93).* Food and Agricultural Policy Research Institute, Iowa State University and University of Missouri: Columbia, USA.

Finger JM and Laird S. 1987. Protection in developed and developing countries - an overview. *J. World Trade Law* 21: 9-24.

Goldin I and van der Mensbrugghe D. 1993. *Trade liberalization: global economic implications.* Organization for Economic Cooperation and Development: Paris, France.

Hathaway DE and Ingco MD. 1995. Agricultural liberalization and the Uruguay Round. Paper presented at the World Bank Conference on the Uruguay Round and the Developing economies, January 26-27 1995, Washington DC. World Bank: Washington DC, USA.

Ingco MD. 1994. Agricultural trade liberalization in the Uruguay Round: one step forward, one step back? International Trade Division, World Bank: Washington DC, USA (mimeo).

Jaeger WK. 1992. *The effects of economic policies on African agriculture (Discussion Paper N° 147).* Africa Technical Department, World Bank: Washington DC, USA.

Jarvis LS. 1977. A stabilization plan to alleviate the impact of international price fluctuations on the Uruguayan economy. Ministry of Agriculture and Fisheries: Montevideo, Uruguay (mimeo).

Jarvis LS 1986. *Livestock development in Latin America.* World Bank: Washington DC, USA.

Johnson DG. 1994. The limited and essential role of government in agriculture and rural life. Elmhirst Memorial Lecture, Conference of the International Association of Agricultural Economists, August 22-29 1994, Harare, Zimbabwe.

Josling TE, Honma M, Lee J. MacLaren, Miner B. Sumner D, Tangermann S and Valdes A. 1994. The Uruguay Round agreement on agriculture: an evaluation (IATRC Commissioned Paper on Bringing Agriculture into the GATT, N° 9). Stanford University: Stanford, USA.

Krueger AO, Schiff M and Valdés A. 1988. Agricultural incentives in developing countries: measuring the effect of sectoral and economywide policies. *World Bank Econ. Rev.* 2: 255-272.

Krueger AO, Schiff M and Valdés A (eds) 1991. *The political economy of agricultural pricing policy.* Johns Hopkins University Press: Baltimore, USA.

Lele U (ed). 1991. *Aid to African agriculture: lessons from two decades of donors' experience.* Johns Hopkins University Press: Baltimore, USA

Matthews A. 1994. Trade reform and the prospects for processed food exports from developing countries. *J. Agric. Econ.* 45: 177-188

Mellor JW and Johnston BP. 1984. The world food equation: interrelations among development, employment and food consumption. *J. Econ. Lit.* 22: 531-574.

Page S. Davenport M and Hewit A. 1991. *The GATT Uruguay Round: effects on developing countries.* Overseas Development Institute: London, UK.

Sanderson P. 1994. *The GATT agreement on agriculture (Discussion Paper Series).* National Center for Food and Agricultural Policy: Washington DC, USA.

Sapelli C. 1984. Government policy and the Uruguayan beef sector (Ph. D. Thesis). University of Chicago: Chicago, USA.

Staal SJ and Shapiro BI. 1994. The effects of price de-control on Kenyan pert-urban dairy: A case study using the policy analysis matrix approach. *Food Policy* 19: 533-549.

UNCTAD. 1989. *Handbook of trade control measures of developing countries 1987: supplement.* United Nations Conference on Trade and Development: Geneva, Switzerland.

UNCTAD. 1992. *Commodity yearbook.* United Nations Conference on Trade and Development: Geneva, Switzerland.

Union of International Associations. 1987. *Yearbook of International Organizations 1987/88.* Saur: Munich, Germany.

USDA. 1993a. *World agriculture: trends and indicators, 1970-91 (Economic Research Service Statistical Bulletin N° 861).* United States Department of Agriculture: Washington DC, USA.

USDA. 1993b. International agriculture and trade reports. Western Hemisphere: Situation and Outlook Series. RS-93-2, September. United States Department of Agriculture: Washington DC, USA.

USDA. 1994. International agriculture and trade Reports. Europe: Situation and Outlook Series. WRS-94-5, September. United States Department of Agriculture: Washington DC, USA.

Valdés A. 1993. Mix and sequencing of economywide and agricultural reforms: Chile and New Zealand. *Agric. Econ.* 8: 295-311

Valdés A. 1973. Trade policy and its effects on the external agricultural trade of Chile, 1945-1965. *American. Agric. Econ.* 55: 154-164.

WIDER. 1990. *Agricultural trade liberalization in the Uruguay Round: implications for developing countries.* World Institute for Development and Economic Research, United Nations: New York, USA.

Williams TO. 1993a. *Impact of livestock pricing policies on meat and milk output in selected sub-Saharan African countries (Research Report N° 20).* International Livestock Centre for Africa: Addis Ababa, Ethiopia.

Williams TO 1993b. Livestock pricing policy in sub-Saharan Africa: objectives, instruments and impact in five countries. *Agric. Econ.* 8: 139-159.

Wonnacott P and Wonnacott R. 1981. Is unilateral tariff reduction preferable to a customs union? The curious case of the missing foreign tariffs. *American Econ. Rev.* 71: 704-714.

Wonnacott P and Wonnacott R. 1992. The customs union issue reopened. *The Manchester School* 60: 119-135.

World Bank. 1981. *Accelerated development in sub-Saharan Africa: an agenda for action.* World Bank: Washington DC, USA.

World Bank. 1993. *Price prospects for major primary commodities 1990-2005 Volume II. Agricultural products, fertilizers, tropical timber.* World Bank: Washington DC, USA.

World Bank. 1994a. *World tables 1994, corrected fall update.* World Bank: Washington DC, USA. (computer disk).

World Bank. 1994b. *Adjustment in Africa: reforms, results, and the road ahead.* Oxford University Press: New York, USA.

Yeats A. 1990. Do African countries pay more for imports? Yes. *World Bank Econ. Rev.* 4: 1-20.

Appendix A. Developing countries by geographical region

Region	Countries
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central Africa Republic, Chad, Comoros, Congo, Cote d'Ivoire, Djibouti, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, Saõ Tome and Principe, Senegal, Sierra Leone, Somalia, Swaziland, Sudan, Tanzania, Togo, Uganda, Zaire, Zambia, Zimbabwe
Asia	Bangladesh, Bhutan, Brunei, Cambodia, China, Hong Kong, India, Indonesia, Korea Democratic People's Republic, Korea Republic, Laos, Macau, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu, Viet Nam
West Asia and North Africa	Afghanistan, Algeria, Bahrain, Cyprus, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, United Arab Emirates, Yemen Arab Republic, Yemen Democratic Republic
Latin America and Caribbean	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, St Kitts-Nevis, St Lucia, St Vincent and Grenadines Suriname Trinidad and Tobago Uruguay Venezuela