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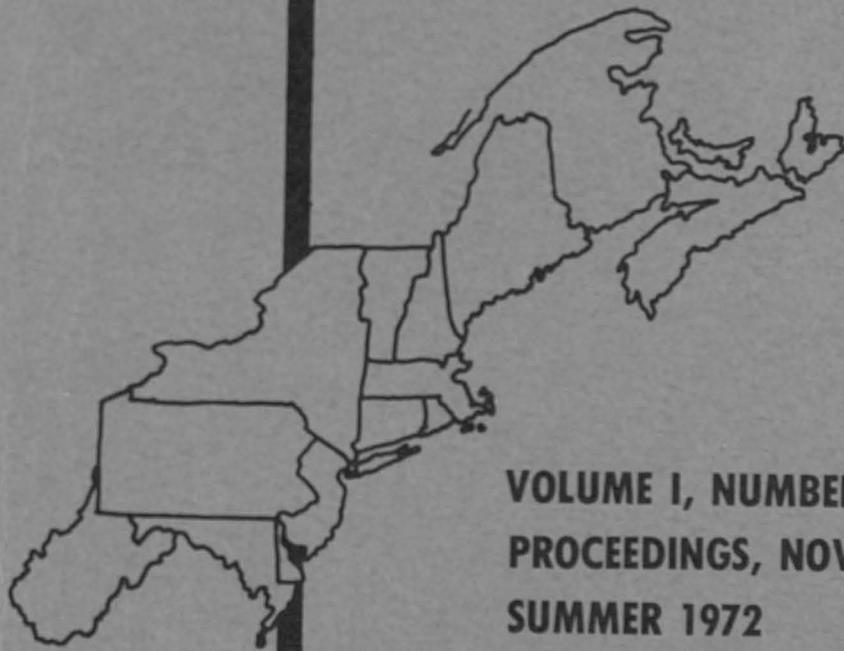
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OBSERVATIONS FROM A RECENT ECONOMIC-DEVELOPMENT STUDY  
FOR THE LIVESTOCK-MEAT INDUSTRY IN PANAMA

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My observations are drawn from an economic-feasibility study for additional cattle slaughtering plants in the Republic of Panama, including aspects of technology as well as location and scale, supply and competition, transportation and market outlets. The study was made early in 1972 during a short-term assignment to the U.S. AID mission in Panama. In making the Panama study I was able to avoid many inadequacies I had encountered in similar studies of proposed new cattle slaughter plants for economic development at various locations in the United States and South America. There were contrasts in these situations and a broader challenge in the Panama study.

I.

One contrast was in the scope and detail of the supporting data, and the scope of analysis, not only on plant cost but also on supply-competition aspects of feasibility. Of the recent proposed new cattle slaughter plants for various U.S. locations that had crossed my desk, many had been supported (but some had not) by reasonable industrial-economic synthesis of investment, equipment, labor and operating costs. But many of them were less specific--some indeed were vague--on the economic setting and factors in which they would operate. To me, this was a critically important part of a feasibility study; yet it was often the Achilles heel of a proposal. Some were proposed for sites with inadequate local supply of slaughter cattle for either a low-cost plant size or for a relatively low-cost utilization of the capacities they proposed; some were proposed in uneconomical locations for competing successfully with established firms or with other sources for the market outlets and delivery points they contemplated. Some were based on assumptions that a local cattle feeding industry of rather large scale would quickly and automatically develop just because of a new packing plant, even though little cattle or grain was locally available, and apparently that it would grow large enough for the needed supply during the two or three years required to build and equip the plant. Some made tenuous assumptions about prices for dressed beef to be sold from a new plant for shipment to distant consuming centers, many deriving their assumed wholesale prices from their current locally prevailing live-cattle prices,

although these were being determined in a supply-competition setting probably much different from that likely if the plant were built. Many proposals came from local development groups interested less because the cattle or the slaughter plants already existed than because there was local imminent or existing unemployment in industries that were principal sources of local payrolls. Thus many proposals were inadequately supported by data and analysis, and other represented mainly a large measure of wistful hopefulness.

In contrast, my early-stage homework for the Panama study showed plenty of cattle in various locations and several concrete problemsituations--for example, a limited number of existing commercial-scale meatpacking plants, one of them needing extensive and expensive modernization, one disadvantageously located relative to a probable least-cost supply location and also surrounding by urban sprawl, thereby probably indicating a higher site-value for alternative uses. The cattle supply areas, slaughter locations, and consuming centers were linked by all-weather roads. There were good basic data on cattle numbers, slaughter, population, consumption and exports. During the planning stage, I was told that much of the additional data I indicated as desirable would be made ready and available on-site, and the interviews I indicated with local cattlemen, bankers, packers and government officials would be arranged.

Bearing out my early impression, operational progress proceeded well during the several weeks I spent in the Republic last winter. The tasks included a mixture of trips to inspect the principal cattle producing regions by auto and low-flying aircraft, visits to all the commercial-scale cattle slaughter plants and many of the local municipal abattoirs, talks with knowledgeable local officials, observations in numerous public markets, supermarkets and carnercerias (specialized butcher shops), digging into Census data, reviewing projections from the Planning Ministry and consultants' reports. There was good liaison between the local AID office and the Ministries of Agriculture, Health and Industry and Trade. A Ministry of Agriculture official expedited arrangements for me, provided my office space, and accompanied me on some of the travel within the Republic.

Since there was not enough time to do a full-scale in-depth detailed analysis of optimum plant sizes and technologies by location for the entire industry, a separate study was indicated for modernizing the numerous small local abattoirs, and I concentrated on least-cost location for one or more new commercial-scale plants of optimum size, in relation to changing technology in the meat distribution system, and indicated the additional more detailed study that might be thought necessary.

As I had expected might happen, the scope of the study desired turned out to be larger than just a feasibility study for an additional plant; there was also a request that I develop a list of appropriate economic criteria for a policy rationale for making decisions on future

applications for additional new plants at various locations. Also as I expected might happen, the complexity of the analysis was more than anticipated. In the past, much of the locally-consumed beef had been marketed unchilled through the public markets, but in recent years, a substantial and growing proportion was moving as chilled beef through supermarkets and carnercerias. Thus the projected trend in capability of the retail meat-distribution sector became a factor of additional importance to the indicated technology in additional new slaughter plants. Since this was a recent development and not yet enumerated or studied, I had to make some observations and projections myself.

II.

Let me summarize the setting and situation of Panama's cattle production, slaughter, market outlets and distribution for beef, and a bit of the role of government in regulation of the industry activity. First, perhaps a few analogies will be useful between Panama's situation and parts of the U.S. Oversimplifying, Panama extends east and west about as widely as Tennessee (or Ohio-Indiana-Illinois); its total area compares roughly with South Carolina, its rural-urban distribution of population and its urban-corridor-concentration of population is similar to Maryland; its annual livestock marketings and slaughter volume similar to northern New England's; its topography and annual wet-dry seasonal sequence of rainfall similar to coastal southern California; its climate, native vegetation (and urban architecture) similar to South Florida (especially the Gulf Coast side) or coastal South Texas.

We can summarize Panama's beef-slaughter-and-distribution situation as I saw it briefly in 1972 under about eight main points.

(1) In Panama, cattle (mainly of Zebu or crossbred Zebu stock) are produced largely on open range and finished on grass until slaughter; this generally requires 4 to 5 years. At slaughter weight, outside finish and marbling are both very low; most of the dressed carcasses I saw in the meatpacking plants would probably range below or near the low-Good border of U.S. grade standards. There were three principal market outlets: export (including a substantial volume to the U.S.), the Canal Zone commissaries and military non-mess (U.S. troops are by law fed grain-fed U.S. beef), and local; they represent three degrees of intensity of health department sanitary and inspection requirement. Much of the slaughtering is done custom--at per-head charges regulated by the government--for the matarifes. (Matarifes are marketing middlemen representing various forms of functional integration, some being retailers themselves and other suppliers to retailers; in both instances the matarifes buy cattle and sell the dressed beef, absorbing risk and shrinkage and paying for hauling and slaughtering.) The Zone and military non-mess outlets are supplied by contract, have their own inspectors and buyers, who "cream out the coolers" (just as important customers do at many medium and small independent meatpacking plants in the U.S.) and pay a few cents above prevailing (i.e., government specified minimum) prices.

(2) Because most of Panama's population is concentrated in the two principal cities of Panama City and Colon, at opposite ends of the Canal, and because much of the meat has been (and still is) distributed unchilled, the earliest and largest abattoir had been located at Panama City. But this largest and now oldest commercial-scale abattoir had problems of increasing cost and declining volume; in recent years it had been surrounded by urban sprawl and beset by declining volume since a second large scale plant was built in the Western provinces during the mid-1960's. The second commercial-scale plant, and a third nearing completion at the time of my visit, were located at David in Chiriqui, the easternmost province, adjoining Costa Rica, 440 kilometers to the west of Panama City.

(3) The principal cattle-raising area comprises four central provinces midway between the two cities where the large commercial abattoirs are located. Cattle raising is most concentrated in two peninsula provinces outlying the Divisa junction, 200 kilometers west of Panama City. For the cattle to be slaughtered coming off grass, subject to possible movement to provinces with a longer rainy (grazing) season, least-cost locational factors would suggest a logical large-scale plant in the Divisa area; and its location, beyond the 2-hour hauling-time limit prescribed for distributing unchilled beef to Panama City, would require refrigeration.

(4) The shift from unchilled to chilled beef for the volume of meat involved in the indicated-scale plant at Divisa in the central provinces would be economically logical if the retailers and consumers had ample refrigeration, and if refrigerated trucks were available, and if consumers would buy chilled beef. I visited numerous public markets, supermarkets and carnercerias to make my own estimates--there being no data readily available--before interviewing supermarket officials about this.

(5) Intercepting the cattle supply from the Central Province for a least-cost slaughter-plant there would further accelerate the declining volume and higher-cost operation at the Abattoir Nacional in Panama City, thereby making its possible modernization less economically attractive as an investment and its projected labor-cost savings through modernization (predicated largely on doubling its volume) less likely in the near term.

(6) However, additional development is likely in the next 10 to 20 years in the largely undeveloped area east of the Canal. Presently the Pan-American highway ends at Chepo, 50 kilometers east of Panama City, but the contract to extend it across Panama and Darien provinces to the Colombian border was let while I was in the country. It seems likely that initially development along the extended highway will be largely subsistence homesites and large scale cattle-raising. This indicates the possibility of future additional needed modern slaughter capacity adjoining or east of Panama City.

(7) Estimating optimum plant size for a projected new plant in the Central provinces was complicated by the possibility of movement of partially-finished cattle from the Peninsular provinces--which have the shortest rainy (grazing) season--to other provinces with a longer grazing season; some cattle would be moved to adjoining provinces and remain available for slaughter to a new plant, but others might move to more distant provinces, outside the least-cost supply area to a new plant at Divisa. There could have been data available for analysis, from the records taken at truck checkpoints along the principal highways; but they were most difficult to obtain from the Census in detail. Accordingly I had to proceed with general information obtained from ranchers, truckers and bankers who finance cattle production enterprises. (The Chase-Manhattan Bank S.A. in Panama City has had an extensive supervised-credit loan program for financing both longterm and shortterm credit needs of cattle producers for nearly 15 years; and its officials and fieldmen had accumulated a wealth of first-hand experience about cattle movements.)

(8) Panama, like most Caribbean countries where much of the meats are distributed unchilled, had numerous additional scattered small-scale local abattoirs of varying equipment, efficiency and sanitary attributes. Separate studies are being made of which to close and which to modernize. Recommended new commercial-scale abattoirs might prove more economical than modernized smaller local abattoirs for supplying their dressed meats, but would require refrigerated trucks and depot in numerous smaller towns and villages. Alternatively, modernized municipal abattoirs might supply unchilled meat at lower cost in these areas, and divert part of the projected supply for a new commercial-scale abattoir.

Naturally, the on-site factors added to the study situation required a larger-than-planned additional follow-up analysis after my return to the U.S.

### III.

I have some additional observations about economic-development studies for developing countries. They are based on my reflections, and on discussions both with other economists who have made similar studies in the U.S. and abroad and with agricultural attaches who have had first-hand experience with a variety of studies and stage-of-development situations. Some relate to needed and available data; others to felt needs and goals; and some to interrelationships between a micro study and related industries.

(1) Panama is said to rank among the countries with better-than-average data base for making economic development studies in agricultural production and in processing, marketing and trade problems. Yet the available data are variable in scope and detail. This implies that for many countries much effort must be devoted to data improvements and projections as an essential early-stage research effort, along with specific development studies.

(2) We should guard against uneconomic overkill in development recommendations. Sometimes this may result from too close a focus on details to be studied and too little attention to important related factors. As an example, some of Panama's commercial-scale abattoirs may be overequipped with unnecessarily expensive rendering technology. Is there need for large driers for meat meal, scheduled to operate 8 hours a day, when smaller driers operated continuously for 24 hours could do the same job? (And incidentally could reduce power consumption during daytime peak-use periods, an important factor in countries where power consumption pushes hard on the transmission-line capacity?) Is there need for the more expensive equipment to segregate edible and inedible tallow materials in a country using most of its tallow almost entirely in soaps and small amounts in feeds--both needing only inedible grade tallow? The quantities of edible-grade tallow produced in Panama seem far in excess of the limited needs for its rather small baking industry, and stocks accumulate unsold because of low export prices. These examples show that we can all err because of too-short time, too-close focus, or too-varying backgrounds that may affect our value sets and therefore our approach.

(3) We should guard against implicit assumptions, in our economic development studies, that the countries being assisted are mainly interested in adopting U.S. (or highly-developed nations') technology and its values and ways of doing things. Our studies need to assist in feasible improvements in their production and marketing systems with a minimum of dislocations. Our recommendations need to consider their cultures and customs; their marketing-system capabilities and customer wants and needs, and their policy goals. Some further examples may show how these might differ from Panama and perhaps for other less-developed countries.

(4) Regarding livestock and meats, policy goals in Panama are to increase production, consumption and byproduct recovery, both edible and inedible. In Panama, beef utilization includes retail cuts from the carcass, most of the tripe, much of the tallow, some of the meat-bone meal, the latter for livestock feed, mainly to poultry and some to hogs. Some variety meats or edible offal are exported, some used at low levels in sausage manufacturing, and the rest tanked or discarded. Improved recoveries would increase the beef supply from an existing cattle base. There is little recovery of dried blood for feed or fertilizer, although tobacco is produced and could utilize it as fertilizer, and tallow is saved only at large commercial abattoirs. From the smaller abattoirs, much byproduct is wasted to the buzzards and small streams.

In some localities, dumping small volumes of certain slaughter-plant products may provide, via short-distance stream flow, an important source of additional nutrients to important shrimp and lobster banks close offshore, particularly where it is mainly blood and paunch contents (to partially digest it) that are dumped. (Panama's fishing industry generates a larger dollar volume of international trade than meats; the

harvest includes Corvina, a whitefish, three kinds and sizes of shrimp, and lobster-sized crayfish similar to South African rock lobster. Domestic seafoods are popular both for home consumption and in the restaurant industry.)

In other localities, packing-plant and particularly municipal wastes are a source of stream pollution that may adversely affect local water supplies or the beaches in nearby resort areas that are being developed. Panama's health department had imposed stiff regulations on waste disposal at existing and planned new slaughter plants, including the local abattoirs that are to be modernized.

(5) Panama's average education and income per family and per capita average higher than for many other Latin American countries; factors include its fortuitous location at a shipping-crossroads, the Republic's share of Canal tolls; incomes to Panamanians employed by the Canal Zone corporation; and the spending in Panama by U.S. troops and tourists. Even among many low-income families, most households enjoy many conveniences--publicly supplied potable water, electricity, TV and refrigerators. While spending patterns and preferences differ among income groups, middle-income and college-trained individuals comprise a rising proportion of those employed in the professions and many government ministries. Particularly in their larger cities, Panamanians have had wider exposure to, and acceptance of change in ideas, technology, and ways of doing things.

(6) Yet in rural areas and similar towns, changes come more slowly and with perhaps more reluctance, partly because of lag and partly for other reasons.

An example is cereal-crop production and imports. There is little grain-feeding of livestock and poultry because there is little feed grain produced. Much of the land suitable for producing grain is devoted to rice, but much is used for pastures and grass hay. Production of rice, a principal staple, fulfills domestic needs, and if further expanded would encounter world-market prices substantially below Panama's fixed domestic prices. There is little production of corn except by hand in small plots for own use; there is little import of grain although some feed grains, mainly corn, are beginning to be imported; there is considerable additional level fertile land available that could be committed to mechanized production of corn; and some small-scale attempts have been made that encountered the usual problems of varieties, tillage, fertilizer and machinery adaptations.

Yet many landowners hesitate to attempt increased corn production. The limited grain imports and most of the domestic meat-bone meal are fed principally to poultry, a widely popular food enjoying high prices. The potential situation for fed grain production includes numerous possibilities, but there are also problems, not all of them lack of technology or experience, but including credit, custom, comparative

returns, and risk factors. Meanwhile, feed-grain exporting countries like the U.S. and Canada may have a potentially valuable market outlet.

IV.

A Concluding Note

Not all economic-development studies are short-term in nature or concentrated in focus. Within countries and regions, their varying cultures, stages of development, scope and detail of data, policy priorities, and near-term needs--as well as staffs and available technical assistance--contribute to varying specifics in the organization and nature of their studies under way and planned, to the mix of production studies and marketing studies, macro- and micro-focus.

This provides a variety of professional opportunities for interested economists of varying background, experience and current interest. Many of the needed studies concern immediate short-run problems, and some can sometimes be scheduled flexibly to fit in with ongoing teaching or research commitments.

The professional satisfactions can be large.