BOLIVIAN PL 480 WHEAT TRANSPORTATION, PROCESSING AND DISTRIBUTION SYSTEM AND POLICIES

by

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Report
to

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FOREWORD

US Wheat Associates is a United States organization funded by US wheat producers and the United States Department of Agriculture for the purpose of promoting the sale and use of wheat and wheat products both domestically and overseas. The mission is to contribute to the development, expansion, and surveying of markets for US wheat and wheat products; to assist in the planning, operation, and evaluation of wheat market development activities; and to assist in solving market development related problems through contacts with government agencies, importers, processors, consumers, and others. US Wheat Associates financed this study as a partial fulfillment of it's mission.

Bolivia has been the recipient of PL 480 wheat under Title III of the act as a third world country for several years. The wheat, No. 2 Hard Red Winter, is shipped from US ports in 20,000-35,000 mt lots to the Chilean ports of Antofagasta and Arica. The wheat is off-loaded by clamshell, and stored in the open on the wharfs, resulting in a potential for contamination. The wheat is moved by dump truck, conveyors, and evacuators within the port. From there, it is transported to Bolivia by Chilean, Bolivian, and private railroads. The distribution of wheat within Bolivia is determined by a quota system developed by a millers association. The wheat is milled and sold as flour to bakers under a government regulated pricing system. Payment for the wheat is a responsibility of the Bolivian government to the United States Agency for International Development (AID) in Bolivian currency. These funds are then to be used for economic development projects within Bolivia by AID and the Bolivian government.

There are currently several perceived or real problems including: loss and damage through transportation and handling, contamination from pigeon fecal material and mineral ores, transportation problems from Chilean ports to Bolivian destinations,

non-payment for grain by the Bolivian government, a milling association that is charging excessive rates for milling wheat into flour, a misguided Bolivian food policy, and Argentine dumping of flour and wheat on the market. Perceived or real, these problems have serious implications for US wheat sales to Bolivia.

Gene Griffin and Ken Casavant were contracted to conduct this study by US Wheat Associates in their interests. Chad Freckman, Assistant Director, US Wheat Associates, South America, arranged for the meetings, provided a well structured and informative itinerary, and acted as supervisor of the study with guidance from Alvaro De La Fuente, Director, US Wheat Associates, South America.

The study was conducted from November 10 through November 22, 1989. Initial meetings were held in La Paz with ADIM, the millers association; an individual miller; the Bolivian Ministry of Commerce; ENFE, the Bolivian owned railway; AID; and AADAA, the Bolivian customs agency. Meetings were then held in Arica with EMPORCHI, the Chilean port authority; FCALP, the Chilean railroad; and the AADAA Arica office. A third set of meetings were held in Antofagasta with EMPORCHI; FCAB, a private railroad; and a miller. Port facilities, transportation yards and equipment, and milling facilities were observed and evaluated throughout the trip.

A briefing of the trip was provided to the Director of South America, Alvaro De La Fuente, in Santiago. A meeting with the Cargill Chilean director was also held. This report was initiated in Chile and was completed by mid-December in the United States.

INTRODUCTION

Bread is indeed the "staple of life" in Bolivia. It is fundamental in the diet of Bolivians at all income levels. With the low income levels of the majority of the Bolivian people, its importance is further increased, sometimes serving as the only item

in a meal. This importance has not been lost on the Bolivian government as it has tried to maintain a cheap bread policy when possible. The government has provided flour to the military and national police in past years, it has encouraged investment in the milling industry, and it has been willing to go into debt for wheat imports.

But, the PL 480 wheat program is at a critical point in Bolivia. Transportation and storage problems are compounded by the present Bolivian wheat policy and its conflict with the AID mission in Bolivia that is administering the program. These policy conflicts threaten Bolivia's remaining a purchaser of US wheat.

This report will review the demand situation in Bolivia, emphasizing location and end use. Then, the physical distribution of PL 480 wheat will be evaluated, looking first at the ocean transportation, then the port alternatives and support, and finally, the transportation within the South American interior. The structure of the Bolivian milling industry and its operating characteristics will be reviewed, followed by an evaluation of the principal agencies in Bolivian wheat policy determination and implementation. A detailed look at local US wheat policy (AID positions) will then be followed by recommendations and findings.

WHEAT DEMAND CHARACTERISTICS

The total wheat consumption needs in Bolivia are fairly consistent at 320-350,000 mt annually. These needs are met by local production, imports of PL 480, Argentine, Canadian, Spanish, and US World Fund wheat, plus the importation of legal and contraband flour from Argentina (Table 1).

TABLE 1. Wheat Import Volume and Source

Source	1987	1988	1989
PL 480	170,000	123,500	101,500
Canada	30,000	10,750	11,500
Argentina	20,000	26,200	45,000
US World Fund	--	1,250	2,000
Spain	--	--	4,000
Total Imports	**220,000**	**161,700**	**164,000**

Domestic production has varied from 60,000 to 80,000 mt and is heavily centered around the Santa Cruz region. The remaining needs are met by the importation of legal and contraband flour from Argentina, estimated to be around 50-80,000 mt per year.

US wheat brought into Bolivia serves almost the entire country, with the exception of the Santa Cruz and Tarija regions that are served heavily by Argentine imports of wheat and flour as well as domestic production. The La Paz area takes slightly over 50 percent of the US wheat imports (Table 4). The Oruro area uses about 25 percent, and the Cochabamba area receives almost 20 percent. The remainder is spread throughout the country's outer regions.

Flour usage is distributed among different users in the country. Seventy-five percent of the flour is sold to bakers, twenty percent goes to pasta makers, and five percent goes to home use. Of the bakers usage, twenty-five percent is used by large industrial bakers and seventy-five percent is used by artisan bakers.

OCEAN TRANSPORTATION OF PL 480 WHEAT FROM THE US TO BOLIVIA

US wheat has moved to Bolivia fairly consistently in recent years in ocean-going barges, built expressly for this type of service, pulled or pushed by tugs. These barges are working quite well for this trade. Most of the shipments, for reasons discussed in this report, occur in the months of July, August, and September. The voyage time from US Gulf ports is 12 to 14 days.

The total fleet available to move this wheat and other similar movements includes three 33,000 mt, two 20,000 mt, and five or six barges of approximately 10,000 mt capacity. Additionally, some other standard ships in the 35,000 mt range are available. The typical cargo size in recent years has been 30-35,000 mt. These barges require about 8.5 to 10.7 m of draft for loading and unloading.

Rates for this movement vary throughout the year, but the recent pattern is around US $45-48 per mt with a recent quote of US $46.95 for 33,500 mt for September delivery. It should be noted that because of the required movement on US ships, Bolivia pays only US $21.80 with USDA having to pay the remainder as a result of the cargo preference laws.

It does appear that these rates can be affected by shipment size and timing. If a smaller ship, such as 10,000 mt is used, the rate increases to around US $60 per mt or, if larger ships rather than barges are used, rates can be increased by another US $5 per mt. If the shipping season can be lengthened or barges chartered earlier in the season, rates can be significantly decreased.

In part, other expenses also affect the net cost of ocean transportation. Dispatch (releasing a ship before the time identified in the charter) results in savings of approximately US $4,000 a day while demurrage (holding a ship longer than the time specified in the charter) costs US $8,000 a day. Fumigation costs are about US $8,000

when the Chilean authority (SAG) finds infestation on board. This cost plus demurrage is incurred by the ship owner but might well be incorporated into the next rate quote to Bolivian shippers. SAG, after some pressure from the Bolivian government and other interests, has found less infested loads in recent shipments.

PORT ALTERNATIVES AND SUPPORT

There are two predominant and one lesser port alternative for moving wheat from the South American West Coast inland to Bolivia. The two best alternatives are the Northern Chile ports of Arica and Antofagasta. Both these ports are operated by EMPORCHI, the Chilean government port agency. The ports of Arica and Antofagasta have their own separate port authorities which operates quasi-autonomously in competition with each other even though they are both administered by EMPORCHI. Port charges for the intra-port movement of Bolivian PL 480 wheat, US $3.99 mt are set by the EMPORCHI central administration in Santiago and are the same for both ports. Thus the ports compete on the basis of service, not price, for the US wheat business. The lesser alternative is the Peruvian port of Matarani.

The port of Arica is located very near the Chilean/Peruvian border. The port has six berths ranging in draft from 4.0 to 11.0 meters. The port is L-shaped with entry from the north. Arica handles cargo to Bolivia such as PL 480 wheat and also exports mahogany, fishmeal, and general cargo. Wheat has not been a major cargo for Arica except for 1989. In past years, most of the PL 480 wheat moved through Antofagasta. Arica has handled between 300,000 and 600,000 mt of total traffic annually from 1984 through 1989. The PL 480 wheat tonnage handled at Arica in 1989 amounted to 77,000 mt which constitutes 13 percent of the total in and out traffic for the port. Thus, PL 480 wheat is significant in volume and importance to Arica. The wheat is discharged from the ocean vessel by clamshell at a rate of 3,600-4,000 mt

per day using three shifts. The wheat is loaded on trucks and transferred to a wharf on the south side of the port where it is piled by conveyor in open storage adjacent to the south seawall. The port has had 67,000 mt in port storage at one time. Space does not appear to be a problem, particularly if cargoes do not arrive at quick intervals. Rail cars are loaded at a later time by moving the wheat by front end loader to a chute which directs the grain onto a conveyor and/or into an evacuator which discharges the grain into a rail car. Arica is served by the Chilean government owned and operated railway, FCALP.

The port of Antofagasta is located approximately 600 km south of Arica but is also in Northern Chile. The port is physically larger than Arica and has seven berths ranging in draft from 7.3 to 12.0 m. Antofagasta exports copper, copper concentrate, fishmeal, handles general cargo, and imports wheat to Bolivia. Antofagasta has served as the major port for the import of Bolivia PL 480 wheat in the past years except for 1989 when the traffic shifted partially to Arica. The port has handled between 1,730,000 to 1,510,000 mt of cargo annually from 1984-1988. PL 480 wheat, over the years, has constituted approximately 7-8 percent of Antofagasta's total tonnage. Although this is slightly less than Arica, it is still important to the port so it competes for the traffic. Wheat constitutes 4 percent of the total tonnage in the current year, 1989.

The wheat is discharged from the vessel by clamshell at a rate of 9,000 mt per day with three shifts, which more than doubles that of Arica. Antofagasta has unloaded as much as 17,000 mt in one day. However, discharge rates were not reported as a problem in either port. The grain is moved to open storage in the same fashion as Arica. The grain is stored openly on the north part of the land side wharf. Antofagasta has handled and stored as much as 100,000 mt at one time. Storage space is not a problem in Antofagasta and if movement of PL 480 wheat is spaced more

evenly in the future, discharge, handling and storage should not be a factor in port selection. Wheat is discharged into the rail cars in the same or similar manner as in Arica using front end loaders. Antofagasta is served by the only privately owned public railroad in Chile, FCAB.

As noted earlier, the bulk of PL 480 wheat has moved through Antofagasta in the past, but that situation was reversed in 1989. The reason for this shift was lower rail freight rates from Arica to La Paz as opposed to the rates from Antofagasta to La Paz. As noted earlier, 50 percent of the wheat is milled in La Paz. The rate differential amounts to US $24.67/mt which resulted in approximately a US $1,700,000 savings in transportation costs to Bolivia, thereby reducing the delivered price of flour to the bakers.

The loss of grain within the port, due to physical handling or theft, appears to be negligible and the same at each port. Earlier reports indicated significant loss, based on observations and discussions, an estimate of 3-5 percent appears to be more appropriate. Although handling at the ports is not conducted with state of the art equipment, it does seem adequate and security appeared to be sufficient as well. However, open storage is of some concern at both ports. Pigeons were noted to be feeding on the wheat at both ports and pigeon fecal material was observed in the wheat at both ports. The loss due to pigeon feeding is perceived not to be a problem; however, the fecal material is of concern. If the fecal material cannot be removed, (one miller indicated that it was impossible to remove all of it), then there is the concern of contamination. A different contamination concern was observed at Antofagasta. Copper concentrate, a black, very fine powder, is stored in the open and loaded into bulker ocean vessels south of the wheat storage, the same direction as the prevailing wind. There is the possibility of contamination from the copper concentrate as it is

loaded and stored. It has not been determined if this contamination poses a health problem or if indeed contamination occurs.

Ocean spray may be a contaminate problem at Arica. The grain is piled against the seawall on the south side. The prevailing south winds send sea spray over the wall and onto the wheat when large swells and waves dash against the rocks at the base of the wall. It appeared that this was not a frequent problem; however, there was no information from which to verify this. Rain was not a problem since it seldom rains at either port. They are located in the driest desert in the world.

The port of Arica has road service to La Paz. The Chilean section of the highway is paved, the Bolivian section is not; however, it is scheduled for pavement by 1991. This presently provides a competitive truck alternative to rail as discussed in the next section. Such an alternative does not exist at Antofagasta.

TRANSPORTATION WITHIN THE SOUTH AMERICAN INTERIOR

Three railroads are involved in the movement of wheat from the North Chilean Coast to Bolivia FCAB, FCALP, & ENFE. Antofagasta is served by FCAB, a privately owned public railroad which serves Northern Chile mining interests and inter-lines with the Bolivian government owned railroad, ENFE, at the border. ENFE serves all destinations for PL 480 wheat within Bolivia. Arica is served by FCALP, the Chilean government owned railway, which interlines with ENFE also at the border but at a different location (see Figure 1). The southern Antofagasta route is the longer route to

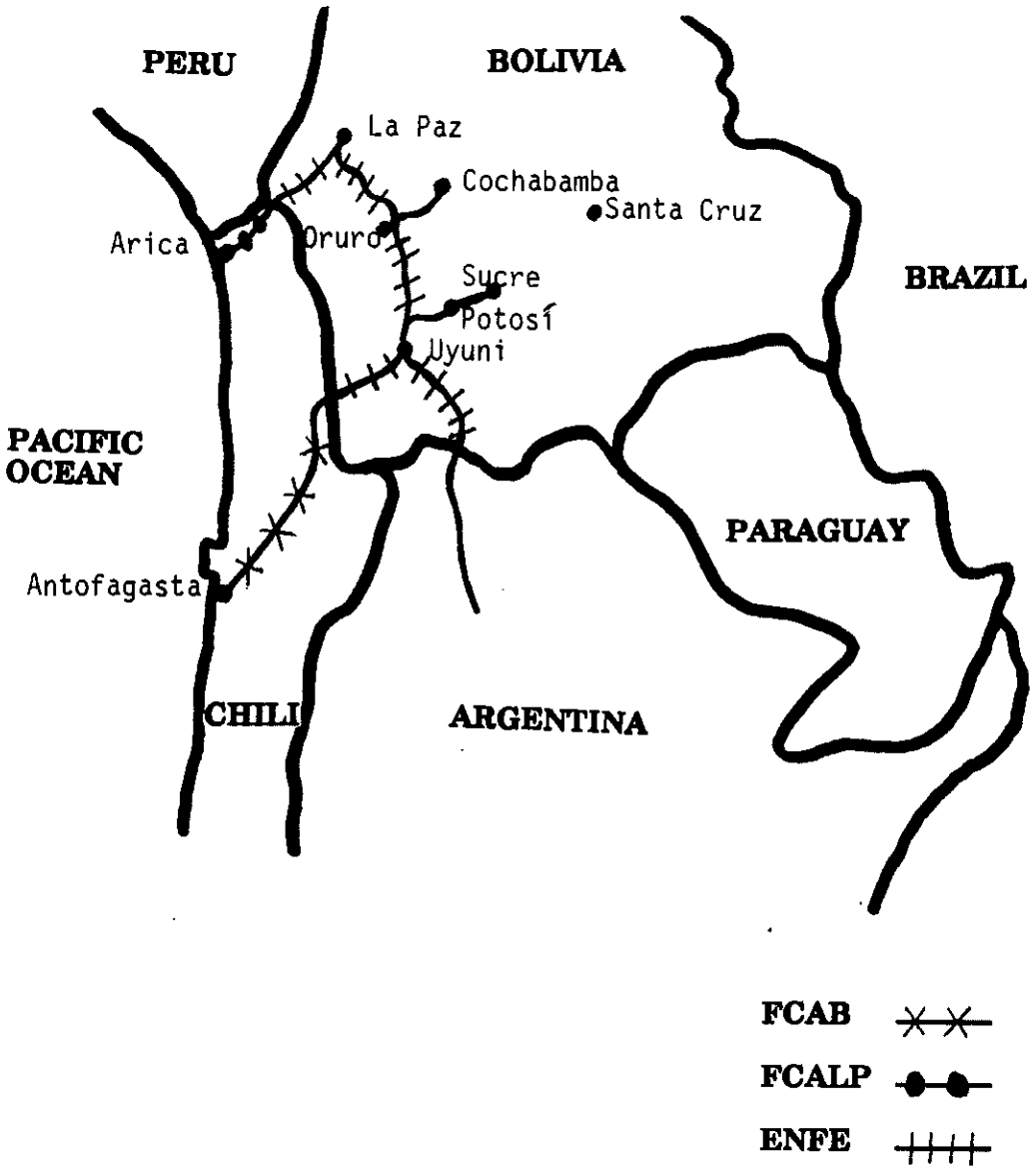

Figure 1. Chilean/Bolivian Rail Network

La Paz, 1,173 km versus 440 km from Arica (see Table 2). However, the Antofagasta route to Uyuni is shorter than the Arica route, 616 km versus 997 km, respectively. The Antofagasta route to the remaining destinations for US wheat, Potosí, Sucre, Cochabamba and Oruro, is longer than the Arica route by roughly 250 km.

TABLE 2. Distances from Antofagasta and Arica to Bolivian Milling Destinations

Destination	Port	
	Antofagasta (Kilometers)	Arica (Kilometers)
CHILE/BOLIVIA BORDER	444	205
UYUNI	616	997
POTOSÍ	895	642
SUCRE	1,069	816
ORURO	930	683
COCHABAMBA	1,142	895
LA PAZ	1,173	440

All three railroads utilize modern diesel power and boxcar equipment. Some of the cars are older and could result in significant loss through loose wooden floor boards; however, most of the equipment was all steel. The newest cars are multi-purpose cars which load from the tops and unload from grates in the floor of the car. The car is equipped with side doors which makes it multi-purpose.

The private railroad, FCAB, which operates from Antofagasta seemed more business oriented based on personal interviews with the three railroads. The managers stated they would consider unit train service to Uyuni and other locations under the right circumstances. The other railroads were also oriented towards meeting shippers needs; however, since they are state owned, they sometimes must meet broader/national objectives.

The Arica route is geographically the more difficult route of the two. The trains must traverse a very steep grade on the Chilean side to get to Bolivia. Thus, the

capacity to move grain is less on this route than on the Antofagasta route given the same level of equipment utilization. Unit train service is not a possibility in conventional terms. The Arica route can reportedly handle a maximum of 900 mt/day and the Antofagasta route can handle 2,000 mt/day. However, this would be under ideal equipment conditions for both routes.

The rates charged by all railroads were reported to be negotiable. The rate from Arica to the Border by FCALP was US $25.38/mt (Table 3). The rates from Antofagasta to the border was $27.00/mt. The Arica rate to the border was lower on a mt basis, however it was much higher on a mt/km basis, than Antofagasta, US $.1238/mt km versus US $.0608 mt/km, respectively, probably reflecting terrain or public policy differences. The rates in the interior also varied significantly by route. The mt/km rate on the Antofagasta route between the border and La Paz is US $.0592 versus US $.0857 on the Arica route. Overall, the rates are comparable from both ports to all destinations with the exception of La Paz. This is due at least in part to the substantial differences in distance.

TABLE 3. Combined Rail Rates from Arica and Antofagasta to Bolivian Flour Mill Destinations

	Border	La Paz	Oruro	Cochabamba	Potosí	Sucre
	---------- US $/MT ----------					
ARICA	25.38	45.52	54.31	66.38	NA	NA
ANTOFAGASTA	27.00	70.19	57.02	70.19	57.02	69.10

The Arica route has had problems moving grain in the past due to equipment shortages. However, that problem has been corrected with the addition of more cars

and additional motive power on the Chilean side. Furthermore, the Chilean railroad plans to bring additional cars and motive power on line in 1990. There were no reported past problems on the Antofagasta route.

Truck movement of grain from the ports is a limited possibility at the present time; this may change in the very near future. The highway system in Bolivia is not well developed. Thus, movement within the borders is limited. However, a good paved and all weather road exists between Arica and the border and there are plans to upgrade the road between the border and La Paz to paved condition. Reportedly, the Bank for International Development is financing this project which is planned for completion in 1991. Thus, the movement of wheat from Arica could become truck competitive in the very near future. The same is not true for Antofagasta. There currently exists a paved and all weather road within Chile that connects with a dirt road at the Bolivian border. There currently are no plans to upgrade the connecting dirt road in Bolivia. A more well developed highway system within Bolivia would increase the options for transportation. Indeed, a system of unit train rail transportation from a port to a distribution point in Bolivia and truck distribution of wheat within Bolivia would certainly be considered an excellent logistical alternative if the infrastructure existed.

STRUCTURE OF THE BOLIVIAN MILLING INDUSTRY

The Bolivian milling industry consists of about 18 mills distributed in the major population regions: La Paz (5 in total, 3 of major size), Oruro (3 in total, 2 of major size), Santa Cruz (2 in total, both major size), Cochabamba (4 in total, 3 of major size), Potosí (1 of major size), Sucre (1 of small size), and Tariza (2, both small). La Paz has 35 percent (925 mt) of total milling capacity in the country and 27 percent (20,500 mt)

of the storage capacity (Table 4). The country's total milling capacity is 2,600 mt/day and total storage capacity is 75,000 mt.

TABLE 4. Capacities and Quotas for Bolivian Wheat Mills, 1989

City and Mill	Milling Capacity (mt/day)	Storage Capacity (mt)	Quota (mt)	Quota ÷ Milling Capacity (%)
La Paz	925	20,510	52,965	
1	330	10,000	19,552	59.3
2	290	6,000	17,182	59.3
3	265	3,700	15,700	59.3
4	25	240	--	
5	15	570	521	34.7
Oruro	544	17,010	23,781	
6	260	7,479	11,366	43.7
7	250	8,780	10,929	43.7
8	34	760	1,486	43.7
Santa Cruz	500	17,870		
9	280	8,070	no PL 480	
10	220	9,800	no PL 480	
Cochabamba	440	13,850	19,793	
11	150	5,500	7,702	51.4
12	150	6,000	7,703	51.4
13	130	1,800	4,388	33.8
14	10	550	no PL 480	
Potosí	109	3,250	4,571	
15	109	3,250	4,571	42
Sucre	50	2,000	2,745	
16	50	2,000	2,745	54.9
Tarija	27	600		
17	20	500	no PL 480	
18	7	100		
TOTAL	2,595	75,090	103,845	

This available milling capacity is currently running at about 25 percent of capacity. A past policy of Bolivia's government has contributed to this excess capacity; in the early 1980s the government granted an "extra favorable exchange rate" for dollars invested in Bolivian industry. Bolivian millers took advantage of this opportunity and many of the mills were expanded at that time.

It should be noted that having excess capacity in the milling industry is a typical, not atypical, characteristic of most South American countries. Estimated milling capacity in some of the other countries are Chile - 2.5 million mt, Colombia - 1.5 million mt, Ecuador - 0.9 million mt, Peru - 2 million mt, and Brazil - 9.5 million mt; all of these are significantly over the average tonnage generally milled in the country.

The millers are very effectively combined into a voluntary, dues paying, association, ADIM, that negotiates with the Bolivian government in establishing the component costs of transporting and milling PL 480 wheat and distributing quotas among its members. It sets up the quotas of US wheat for each member to be milled in each region. It also is the entity that contracts with the government for payment of the wheat and transportation charges, by accepting payments from each miller according to wheat usage and movement.

ADIM and its activities are a major point of contention in the marketing of wheat. When ADIM, or its members, stop milling, the entire system of wheat distribution becomes clogged and all movement stops. If ADIM's members don't want to move wheat to their mill, in an attempt to avoid early payment of transportation charges, this causes congestion and inefficiencies in the ports and transportation modes.

This is aggravated, from the Bolivian perspective, since storage at the Chilean port is free for one year. Even though the Chilean Ministry of Finance must pay storage to the Port Authority after 90 days, this cost is still not passed on to Bolivian

mill owners, or the Bolivian government, hence no incentive exists to move the grain into the country in a timely manner. The fact that millers must pay for the transportation charges immediately once they receive the wheat further exacerbates this problem.

BOLIVIAN WHEAT POLICY AND PROCESSING

The overriding objective of the Bolivian Government as it determines the structure of its wheat program seems to be a desire for stable bread prices, with no shortages, and as low a price as is politically and economically possible. This desire for stable and cheap food is accentuated by the recent teacher's strike and demonstration (tearfully witnessed by the consultants) and the State of Siege declared recently by the Bolivian Government. This wheat policy and desire for economic development in the country increases the importance of PL 480 wheat shipments because this program offers stability to both components - wheat availability and economic development.

ADIM's Role

The Association of Flour Millers in Bolivia (Asociación de Industriles Molineroso-ADIM) has a strong and complex role in implementing Bolivian wheat policy. Each year ADIM signs a contract with the government that establishes ADIM as the entity that distributes the imported wheat to its members. ADIM is composed of the 18 or so flour mills that control essentially all storage and milling capacity in the country. The contract and process for determining the price of flour allows a given cost of milling for ADIM to be included in the final flour price (see attached flour price determination Appendix Table 1). This flour price is controlled, however bread prices are allowed to float free (some understanding on acceptable ranges of prices is reached between the government and the bakers of bread).

The government assigns the wheat to ADIM mills as a percentage to each geographical region, based on population and historic consumption needs. ADIM then distributes the wheat to the mills based on the milling capacity of the plants. Table 4 shows the location, milling and storage capacity quota by region and plant and also the relationship of milling capacity to quota. It is obvious that there is significant excess capacity in the industry. This probably arose because the only way a firm can increase its share of the quota is to increase milling capacity and, as indicated earlier, in past years, a favorable exchange rate was provided for firms in the country willing to invest. With some small variation, usually caused by the opening or closing of a plant in a region, the millers seem to allocate the quota quite evenly within a region. Since this process ignored mill economies of size or scale it is doubtful this is a cost minimization allocation; rather, it is a politically defendable result.

While ADIM's cost of milling allowance is under scrutiny by various groups, ADIM's members do have concerns about the wheat program. As is discussed below, they have serious concerns about the imports of Argentine flour at a price lower than the PL 480 flour they are selling. Since flour loses quality after one month, they are presently only milling one week a month because of slow sales. Since they pay their labor for the entire month, excess labor costs are incurred.

The millers are required to pay transportation costs three days after receiving the wheat into their mill. If the flour is not being sold, the millers incur interest charges (32 percent Bolivian, 22-24 percent US) on the transportation bill it previously paid. This cost is not included in the cost of milling allowed by the government and thus reduces the profit margin realized by the millers. Because of this, the millers are reluctant to, and have almost stopped, ordering wheat from the ports until the flour is selling more quickly to the bakers. This further exacerbates the storage, congestion, and quality loss problems at the port, the initial reason for this study.

Ministry of Commerce's Role

The Ministry of Commerce is the implementation agency of the Bolivian Government for the PL 480 program. In addition to negotiating contracts and cost allowances with ADIM, it also, through its agents, determines dates, destinations, carriers, etc. for the PL 480 shipments. It sets the overall quota and cost of flour in the market. Further, and very importantly, it establishes and implements the governmental policy towards allowing Argentine or other import wheat or flour into the country.

The importance of this Ministry is also apparent in that it was this Ministry that caused most of the US $11 million deficit in the PL 480 account when it gave flour to the military and police units free of charge in the early 80s. This deficit has since become a point of contention, discussed later, among AID, the US Government, ADIM, and the Bolivian Government.

The role of the Ministry might be modified in the future in this area of wheat policy. A Commission has been established to examine the costs of milling allowed to ADIM firms in an attempt to determine the true milling cost. Additionally, a new interministry commission has been set up to develop a comprehensive policy and implementation program for wheat, both PL 480 and other imports.

Other Agencies

Several other entities affecting or implementing Bolivian wheat policy are AADAA, and ENFE. AADAA is the custom inspection agency for Bolivia, and is the only Bolivian organization, by law, that can handle goods coming into Chile destined for Bolivia. Their responsibility, in transit ports, is to receive the wheat and contract

with stevedore companies for the reloading, loading and movement in port. They provide "notice of readiness" to the ocean ship to unload, provide information to the railroad about expected shipment volumes and dates, and identify information to the Ministry and ADIM on wheat that has been shipped. They collect weighing data and work with the railroad in accounting for the volume moved. It is AADAA's responsibility to have the wheat moved and stored. If new storage facilities were built at either port or in Bolivia it could be expected that they would fall under AADAA's responsibility. However, it is unlikely that Bolivian facilities could be built in Chilean ports because of Chilean law which prohibits foreign ownership. AADAA also negotiates the location of the open storage and moving of the wheat with the port authority. Officials of AADAA express openly their concern about the adequacy and accuracy of weighing equipment at the two ports of Arica and Antofagasta.

ENFE is the state-owned Bolivian railroad and moves all of the US wheat into the country. Its rate structure is based on costs developed in a Brazilian and World Bank process which incorporates distance, weight, type of commodity, etc. Wheat has always had a preferred status, with only variable costs being covered by the rates, about 25-30 below total cost. This is because wheat is so important to the country's food policy. Since 60 percent of the railroads total import volume is wheat, they attempt to be innovative and responsive to competition.

The extreme variation in orders by the millers, under the existing wheat policy, creates logistical problems for ENFE. They have had cars at the ports for a month waiting for the grain to be ordered, cars that are needed to move other products in the country.

Imports of Flour and Wheat

The need to balance the power of the different agencies creates new policy decisions. Since the Supreme Decree 21060 in 1985, imports of all goods into Bolivia have been allowed, with the exception of cooking oil and sugar, as long as a 17 percent duty is paid by the importer. Some contraband products, where the 17 percent duty is not paid, also move into the country. Because of the present exchange rate and inflation situation in Argentina, Argentine flour has been moving in significant volumes into Bolivia. This grain moves in at roughly a US $57 per mt of wheat differential, according to ADIM personnel. Further, the Argentine sellers offer two months of credit, further increasing its competition to Bolivian millers. When flour is imported, the bran and germ byproducts are lost to the country but even ADIM says they lack value because of the lack of a concentrated livestock industry. The Argentine millers may also be extracting above the 72 percent legal limit imposed on the Bolivian millers, further affecting the competitive situation.

It does appear that continued imports of Argentine flour could kill or seriously damage the Bolivian flour milling industry. This would mean loss of jobs in the country and make the economy and food system entirely dependent on the Argentine flour availability and price structure. This dependence on a foreign power could well create instability or cause uneasiness for the food policy of Bolivia.

A related, and relevant, impact on Bolivia of the elimination of US wheat to its flour milling industry is the loss of PL 480 dollars to fund vital capital investment projects for economic development in the country. In summary, if economic development as well as economic independence of its food supply, are the goals of the Bolivian Government, then some control of the Argentine flour supply seems appropriate.

LOCAL US WHEAT POLICY

Wheat Policy Position of Local US Representative, US-AID

Other than the visits of US Wheat Associates personnel, the only US representative with a continuing presence in Bolivia is AID. AID's mission is to promote economic growth and development in the country. Sales of US wheat via the PL 480, Title III program provide the capital for development projects in the country so as to stimulate that growth. However, the present position of AID towards future PL 480 sales may affect that goal as well as the goal of maintaining or increasing sale of US wheat into the country.

The payment for the US wheat, within nine months from CCC disbursement, is supposed to be deposited to the account of the Joint Committee on Rural Development, which is the coordinator of such development projects. But the Government of Bolivia is US $11 million behind in payments to this account. The US $11 million arose because of government subsidies (cheap bread policy) in the early 1980s, US $8 million of donations of flour to the military and state police, and about US $2 million in recent years from late payments by ADIM or the government. The Bolivian government under pressure from the US, is attempting to pay off the arrears at US $850,000 a month. One payment was made around September but the new government maintains they have inadequate funding to repay the balance at this time.

These delinquent payments have created tension between ADIM, the Bolivian Government and the local AID mission. This has affected AID's perspective on the activities of ADIM and others. AID feels strongly that ADIM has been operating as a cartel and unduly influencing the government. They feel the millers want fixed prices, no risk, and high milling cost payments. Much of the problem of arrears and higher bread prices can, from AID's perspective, be laid at the door of ADIM. Further, AID points out the present slow down of sales and concern about competitive imports could

be contrived by ADIM since the present sales are 10 percent ahead of last year, rather than behind.

Based on this intense concern about ADIM's power and the present Bolivian arrears, AID Washington and the US Inspector General have adopted the position, "if the US $11 million is not repaid into the development account, no PL 480 program will be instituted for 1990." The seriousness of this position is exemplified by the decision of AID to not ask for a US $5 million addition to the program in 1989, a request that would probably have been granted (this means about 40,000 mt of US wheat were not sold to Bolivia).

The goal of AID seems to be to change the overall control of cost of milling and retail prices. To do so they are considering tendering for the right to import wheat. If no response to the tender is received, AID may well import US flour rather than US wheat. Because of the cost of milling flour in the United States, the volume of wheat that can be purchased for a given PL 480 authorization will be less. This reduces the amount of US wheat sold into the market and decreases the amount of flour available to the people of Bolivia.

The AID mission is possibly concerned about outside evaluation of their program. The reaction is to adopt a hard policy towards ADIM. The concern about this policy is that the development projects and overall function of the AID mission may be negated in order to fight the supposed cartel and to avoid institutional embarrassment. This type of policy could potentially have a catastrophic impact on the Bolivian flour milling industry and AID sponsored economic development in Bolivia. Many other countries in the world have fallen behind in repayment to a commercial or US funding source without having their development projects or programs held hostage. It would seem inappropriate that it happen to the people of Bolivia.

SUMMARY AND RECOMMENDATIONS

The PL 480 wheat program and the overall Bolivian food, milling, transportation, and importing policies are very complex with several public and private sector institutional participants. Furthermore, because of the less developed nature of the country, the logistical system is underdeveloped. This results in a complicated situation in which no single alternative appears vastly superior to another.

The PL 480 program offers the people of Bolivia a stable source of good quality wheat, from a price and supply perspective. Under Title III of the program, the wheat is front-end financed by the United States and payment is made in Bolivian currency. Furthermore, the payment is then used for economic development within the country by AID. Thus, it would seem that PL 480 provides an excellent opportunity for Bolivia to feed its people and improve economic development at the same time.

Port Facilities

Physical loss and damage of grain, one of the concerns underlying this study, is estimated at 3-5 percent. The following recommendations should serve to decrease that loss as well as improve the policy aspects of consumption of US wheat in Bolivia.

The development of storage and handling facilities at the ports of Arica and/or Antofagasta would eliminate the problem of contamination or potential contamination at either port. The problem is who would build, own, and operate such facilities, how would they be financed and paid for; and where would they be located? Chilean law precludes foreign ownership of port facilities. Thus, some Chilean company or EMPORCHI would have to build and own such facilities. The location of such facilities would depend on the transportation route used since both ports seem to be adequate in

terms of storage space, unloading and loading equipment, and security. The size of such a facility would depend on the shipment size, the timing of shipment arrivals, and the movement of wheat to Bolivia. A 35,000 mt facility should be sufficient in size assuming that shipments, both in and out, can be evened out. If the movement of grain could be mechanized, the resulting savings that would be generated could then be used to pay for such a facility. AADAA currently pays US $3.99/mt for trucking, piling and loading of wheat in port. A 35,000 mt facility would cost approximately US $1.3 to 2.0 million, based on US prices.

The likelihood of a port facility being built appears to be low for both political and economic reasons. However, if a port facility were built, it would decrease the logistical need for inland storage facilities.

If Arica continues to be used as a port for PL 480 grain, a modern scale should be installed at the port. Such a scale would allow for an accurate determination of the amount of grain that is shipped from the port.

Burlap sacks filled with grain are used to build temporary retaining walls. The bags should be eliminated from use because of the potential of infestation that results from their use. The burlap absorbs moisture creating an environment conducive to infestation.

Inland Storage Facilities

Construction of inland storage facilities should be a high priority for Bolivia. Inland facilities would allow grain to be moved quickly from the ports which would minimize degradation and contamination problems. Inland facilities would also provide for control of PL 480 grain by the Bolivian Government. The facilities could either be concrete or steel depending on the availability of materials, equipment, know-how and

price. It should be recognized that steel has a limited life compared to concrete. The cost of such a facility constructed in the US runs approximately US $37/mt.

A facility could be constructed at La Paz or at Uyuni or both locations. The advantage of La Paz is that is where 50 percent of the PL 480 wheat is consumed and transportation costs can be reduced by shipping through Arica. The disadvantage is that the Arica is a much slower route and more difficult rail route compared to Antofagasta. This disadvantage can be overcome by building storage facilities at Arica.

A storage facility at Uyuni has two main advantages. First, it is a rail junction. Northern Bolivia, Chile and Argentina are all served from Uyuni. The second advantage is that the Antofagasta route is logistically better than the Arica route. Unit train service could be developed, with service by FCAB straight through from Antofagasta. The rail rates to all destinations except La Paz are comparable from both ports. The additional transportation costs to La Paz is the main disadvantage of Uyuni. Rates may be able to be negotiated at a lower level if unit train service can be developed. There is also a greater opportunity for direct discharge at Antofagasta than at Arica which could also result in additional savings (50 percent of $3.99/mt handling charges).

Shipment Timing

The timing of the shipment plays an important role in the location and size of any storage facility plan. The shipments should be spread throughout the year as much as possible to minimize the investment requirements, decrease transportation rates, as well as minimize potential contamination problems. To accomplish this, the Bolivian government and AID need to work together to get a signed PL 480 agreement as early as possible in the fiscal year to allow the maximum amount of time possible for shipping grain.

Bolivian Milling Industry Policy

Most, if not all sovereign countries, prefer to have some control and influence over basic food supplies for its people, as a matter of national independence. The milling industry in Bolivia is an important link in that food supply chain and provides the country with flexibility and alternatives in supplying Bolivians with one of the staples of life, bread. With this in mind, it would seem appropriate that the country maintain an economically healthy, technologically modern, and safe food milling industry. The following section is based on this premise.

The Bolivian milling industry is operating significantly under its rated capacity (25 percent). This would indicate that it is operating inefficiently on the high side of the short run average cost curve. This was cited as being typical of South American countries. Typical or not, it does result in increased cost for milling wheat into flour. There does not appear to be any simple solution to this economic inefficiency.

Some would argue, possibly AID, that the millers association, ADIM, should be eliminated and that economic free market forces be allowed to restructure a more efficient industry. On the surface, this may appear to be an appropriate policy if technological efficiency is the goal of public policy. However, because of the political and economic nature of South America and Bolivia, this is not possible. Because of the tremendous over-capacity, 3 to 4 of the large mills could adequately meet the capacity needs for Bolivia. Given the fixed cost/sunk cost nature of the industry, tremendous concentration would very likely take place rapidly under such a policy. The result would be approximately 2 to 3 mills operating in Western Bolivia under the ownership of three or less firms. This assumes of course that the existing cartel could not be

maintained under such a policy. The question must be asked: is Bolivia better off with some form of government sanctioned association, or a 2 to 3 firm oligopoly? The spacial separation created by the political sovereignty of the South American countries causes this concentration. Many of the countries do not have sufficient demand to require a large number of competing firms which are technologically efficient. It appears that the existing industry structure is a better alternative to a concentrated 2-3 firm industry.

However, the current environment is less than desirable, particularly with the import environment of flour from Argentina. The unrestricted importation of Argentinean flour may kill the Bolivian milling industry, eliminate the PL 480 program, and threaten the long term stability of bread supply and prices. Thus, the Bolivian government will have to consider time-sensitive import quotas of Argentine flour. The government should also consider taking more control over PL 480 and other wheat from the ports as well.

SPECIFIC RECOMMENDATIONS

1. Installation of a modern scales at ports and receiving mills.
2. Elimination of the use of burlap sacks as temporary retaining walls.
3. Early signing of the PL 480 agreement to allow for a more even distribution of shipments with disbursement throughout the year.
4. Development of a temporary 10,000 - 15,000 mt storage facility at Antofagasta to reduce the problem of contamination.
5. Development of a storage facility at Uyuni of approximately 25,000 - 30,000 metric mt. This would assume that some wheat could be shipped directly to the mills. This would provide the Bolivian government better control of PL 480 wheat.
6. Unit train shipments from Antofagasta to Uyuni by FCAB with an attempt to direct discharge as much wheat as possible resulting in additional savings. To achieve transportation and storage efficiencies, most grain should be moved through Antofagasta. If ocean shipments bunch up, Arica should be utilized for surge capacity.

7. Create a plan to develop a highway system within Bolivia from which wheat could be distributed by truck from a Uyuni storage facility to the various mills. Such a road system would encourage other economic activity and development. This is a longer term recommendation.

8. Implementation of import quotas on foreign flour consistent with the country's milling capacity, the availability of PL 480 wheat, and the country's demand for flour.

9. Improved regulation of the milling industry and rationalization of the excess capacity. This can be accomplished by requiring that mills be licenced by the federal government. An alternative is to lower the guaranteed cost for milling and let the association exist as it is presently organized.

These specific recommendations will accomplish two objectives: (1) it captures, to the greatest extent possible, economies of throughput, transportation, and storage, and (2) it provides the government of Bolivia with greater control of US wheat. The end goal of these recommendations is to provide the Bolivian people with a safe, reliable, and economically affordable supply of bread flour.

APPENDIX TABLE 1. ESTIMATE FOR THE IMPORTATION OF 104,370 MT. OF PL-480-89 WHEAT

(US$/MT)

	PORT OF ARICA					PORT OF ANTOFAGASTA							PORT OF MATARANI			THREE PORT
	SHIP: ENERGY FREEDOM AND MARY FLOOD M.T. 33,500 + 32,975 = 66,475					SHIP: STAR OF TEXAS M.T. 34,500							SHIP: JAMES LYKES M.T. 2,870			
DETAIL	EL ALTO	LA PAZ	ORURO	COCHABAMBA	AVERAGE	EL ALTO	LA PAZ	ORURO	COCHABAMBA	POTOSÍ	SUCRE	AVERAGE	EL ALTO	LA PAZ	AVERAGE	AVERAGE
1 USA FOB price	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88	162.88
2 Maritime freight	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80	21.80
3 Opening commission	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
4 Banker commission	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
5 Transport insurance	0.54	0.54	0.54	0.54	0.54	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.54	0.54	0.54	0.55
6 A.A.D.A.A. Expense	6.50	6.50	6.50	6.50	6.50	7.00	7.00	7.00	7.00	7.00	7.00	7.00	6.00	6.00	6.00	6.65
7 Rail Rate to Border	25.38	25.38	25.38	25.38	25.38	27.00	27.00	27.00	27.00	27.00	27.00	27.00	26.00	26.00	26.00	25.93
8 Freight E.N.F.E.[1]	19.05	20.14	28.93	41.00	26.35	42.10	43.19	30.02	43.19	30.02	42.10	34.07	18.57	14.80	14.34	28.58
9 Switching Charge	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
10 Customs Office	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
11 Loss in Transit	7.19	7.22	7.49	7.85	7.41	7.95	7.98	7.58	7.98	7.58	7.95	7.70	7.03	7.07	7.05	7.50
12 Sales Tax[2]	2.17	2.17	2.17	2.17	2.17	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.17	2.17	2.17	2.18
13 Milling cost	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82	36.82
A Total Cost of Flour	285.83	286.96	296.01	308.44	293.35	311.81	312.93	299.37	312.93	299.37	311.81	303.54	280.31	281.58	281.11	296.39
B Price in US$/qq	18.01	18.08	18.65	19.43	18.24	19.64	19.71	18.86	19.71	18.86	19.64	19.50	17.66	17.74	17.71	18.67
C Price of the dollar	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78
D Net price Bs/qq	50.06	50.26	51.84	54.02	50.71	54.61	54.81	52.43	54.81	52.43	54.61	54.22	49.09	49.32	49.23	51.91
E Final price Bs/qq	56.25	56.47	58.25	60.70	56.98	61.36	61.58	58.91	61.58	58.91	61.36	60.92	55.16	55.41	55.32	58.33
a Prices[3]	57.47	57.47	58.53	59.61	58.15	57.47	57.47	58.53	59.61	58.53	59.61	58.47	57.47	57.47	57.47	58.24
b Net price	51.15	51.15	52.09	53.05	51.75	51.15	51.15	52.09	53.05	52.09	53.05	52.04	51.15	51.15	51.15	51.83
c Revenue per MT	292.04	292.04	297.43	302.92	295.49	292.04	292.04	297.43	302.92	297.43	302.92	297.11	292.04	292.04	292.04	295.93
d Milling & other charges	101.15	102.28	111.33	123.76	108.67	127.13	128.25	114.69	128.25	114.69	127.13	118.86	95.63	96.90	96.43	111.71
e General funds	190.89	189.77	186.10	179.16	186.82	164.91	163.79	182.74	174.66	182.74	175.79	178.25	196.41	195.14	195.61	184.22
f Freight & Expenses	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68	184.68
g General funds minus freight & expenses	6.21	5.09	1.42	(5.52)	2.14	<19.77>	<20.83>	<1.94>	<10.02>	(1.94>	<8.89>	<6.43>	11.73	10.46	10.93	<0.46>

[1]Letter from ENFE

[2]1% of Items 1, 2, 6, 7, and 8

[3]August 24, 1989
La Paz, September 30, 1989 - PL89PPTO