The differences between urban marketing and consumption of vegetables versus staple foods

A case study on snap bean consumption and marketing in Bogotá. Colombia

CIAT

Centro Internacional de Agricultura Tropical

Cali, Colombia

3 / THE DIFFERENCES BETWEEN URBAN MARKETING AND CONSUMPTION

OF VEGETABLES VERSUS STAPLE FOODS.

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March 1988

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PREFACE

In the Consultative Group on International Agricultural Research (CGIAR), there is interest for vegetable research since 1974. The motivations were:

- diet diversification and improvement;
- increasing importance with income growth;
- income potential for small farmers;
- employment for landless labor.

However, the low data availability has strongly constrained balanced decision making. In 1983 the Technical Advisory Committee (TAC) of the CGIAR recommended that CIAT should do a study on the economic potential of snap beans. CIAT already has the world mandate within the CGIAR for the improvement of dry beans. TAC thought it was useful to understand whether this mandate should be extended with the improvement of snap beans. Genetically snap beans and dry beans belong to the same species (Phaseolus Vulgaris). The goal became to understand in more detail the importance of snap beans, as well as the factors that are presently limiting production and consumption. As part of the study of the economic potential of snap beans, CIAT had planned to do a number of case studies in different countries in the developing world.

ACKNOWLEDGEMENTS

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1 A THEORETICAL CONSIDERATION OF THE URBAN MARKETING AND CONSUMPTION OF VEGETABLES VERSUS STAPLE FOODS

The next scheme will be used as a guideline to describe the issues in which marketing and consumption of vegetables differ from staple foods. The consumption and demand characteristics can be seen as a result of consumer characteristics and product characteristics. The marketing and market structure then is a result of product characteristics, production characteristics and consumption and demand characteristics. Of course this scheme is a simplification of reality, which is much more complicated for its (inter)relations, but it can serve as a guideline to highlight the most important issues.

Consumer characteristics

The most of the developing countries are characterized by a fast urban growth, and thus a fast growing demand for food (Francois,1981; Forman, ? ; Bucklin,1977; FAO,1973). It is recognized that with urbanization, food habits tend to change, due to rising incomes, more demand for convenience goods, promotion of certain foods, etc., which can benefit the consumption of vegetables[1]. However, in the first years of being established in a city, the place of origin will have a certain influence on the adaptation of the urban food habits (Duque,1983).

One of the first needs of consumers in food consumption is for part of the calories and proteins. For a great deal staple foods can provide those needs. If there is a deficiency of calories and/or proteins within the household, than this well first be provided, before people will set themselves to consumption of vegetables. At all income levels, people will therefore consume staple foods, although consumers in high income strata

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[1] Data of a nation wide nutrition survey of DANE DRI in Colombia, analyzed by CIAT, show for example in the urban sector a higher level of meat and vegetable consumption, and a lower level of cassava and potato consumption, than in the rural sector (Duque,1984).

transport facilities
household composition
income
education
nutritional status
calorie needs
urbanization
storage possibilities

CONSUMER CHARACTERISTICS

low calories
vitamins/minerals
high prices
perishability

DEMAND AND CONSUMPTION
CHARACTERISTICS

perishability
heaviness
product range
seasonality

PRODUCT CHARACTERISTICS

MARKETING CHARACTERISTICS

farm size
location
harvest schedules
cycle length
substitutions in
        production area
labor intensity

PRODUCTION CHARACTERISTICS

physical presence of
    the product
purchasing frequency
number of traders
transaction size
trade policy
cost structure
availability
distribution velocity
governmental price
    control

figure 1   Issues in the urban marketing and consumption of vegetables versus
            staple foods

will face more possibilities to replace a certain part of the staple food consumption by other products, like meat and vegetables[1]' (Pachico,1987). Staple foods therefore have low, or sometimes even negative income elasticities (Duque,1983; Ross,1980; Caicedo,1978; APO,1976). Vegetables on the other hand often show high income elasticities (Musgrove,1985).

Staple foods are mostly nearby available, for example, in one of the many neighborhood shops. Vegetables, on the other hand can often only be found in more specific outlets, like market places. When consumers face good transport facilities, then buying frequency, buying quantity and buying places can easily be adapted to the circumstances, which will particularly benefit the vegetable consumption (Harrison,1974).

Education level is important in the way that higher education levels often go along with better knowledge of the (different) nutrients. This can raise the need for food that is rich in vitamins and minerals. For staple foods, there will exist less influence of the education·level (Dewalt,1977).

If the consumers have enough cash to their disposal, than they can easily buy big amounts of grains and, although to a lesser extent, tubers, without facing problems with keeping the product fresh. For vegetables on the other hand, one must have at least a refrigerator, if he wants to buy big amounts. But still there exist more limitation on the conservation time as is the case with staple foods (Kaynak,1981; Janssen,1985).

The per capita consumption of individual foods tends to change according to age of the housewife. To a large extent this pattern may reflect the associated differences between the number of adults and children, between total household income and between changing food patterns in different generations. According to those differences, the relative

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1) In Latin America, meat forms an important completion of the meal (FAO,1985; Duque,1984), while in some Asian countries, for example Korea, vegetables are important products to complete the meals (Han,1969).

consumption of staple foods versus vegetables can be different (Derry,1985; Musgrove,1985).

Product characteristics

One of the first characteristics of vegetable products versus staple foods is that they are much more perishable. Staple foods can be stored for quite a long time without decay to any extent[1]. Vegetables on the other hand can hardly be stored at all (Torres,1977). According to perishability, the availability of vegetables is more tied for season, than staple foods are. In association with supply, prices of vegetables vary much more than of staple foods.

Staple foods, as the name already indicates, serve in filling the stomach. They are characterized by high calorie and protein contents and low water contents. The contrary is true for most of the vegetables which on the other hand have high contents of vitamins and minerals (I.N.N.,1967).

Noteworthy also is that vegetables enclose a broad range of different products, while staple foods include only a few different products (APO,1976).

Consumption and demand characteristics

Due to urbanization and rising incomes, the demand for vegetables grows relatively faster than for staple foods. Vegetables are appreciated for its taste, vitamins and minerals, while staple foods are appreciated for satisfying hungry feelings and giving energy. Staple foods form for this reason the base of meals, while vegetables complete them. In accordance with the different functions of the products, consumption quantities of vegetables will in general be lower than of staple foods.

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1) Most true it is for food grains, like rice, wheat and maize (Coscia,1980; APO,1976; Lele,1971). Potatoes are already more perishable (Scott,1985) and cassave comes very near vegetables (Janssen,1986).

Vegetable consumption is characterized by high price elasticities (Musgrove,1985), which are higher in low income strata than in high income strata. Because prices of vegetables fluctuate fast and between wide ranges, consumption levels of the individual vegetables alter a lot (Luna,1987; Harrison,1974). Those alterations of consumption levels are also stimulated by the broad range of substitutes within the vegetable products. To the contrary of vegetables, the demand for individual staple foods is much more rigid, due to lower price elasticities, less price fluctuations, and less alternatives in the product range (Coscia,1980; APO,1976).

In accordance with consumption levels, buying quantities of vegetables will be lower than of staple foods. But there is also another constraint on buying big amounts of vegetables at one time; that is perishability. If one wants to consume a lot of vegetables, than he has to buy more frequently in stead of buying big amounts in advance. This won't benefit the commodiousness of the vegetable products (Janssen,1985; Kaynak,1981; Harrison,1974).

Production characteristics

Although production is not of interest in this case study, it will briefly be discussed here, for obtaining a better understanding of the urban marketing characteristics.

Vegetable production is labor intensive, when compared with staple food production. A lot of work has to be done by hand, while most of the agricultural work for staple foods can be done by machinery. For this reason vegetables are of interest for particularly small farmers (Janssen,1987). A result is that vegetable production happens to be done by a lot of small farmers. This big number of producers, together with the necessary fast transport to the consumption area, makes that collection and/or transport becomes very labor intensive too (Dijken,1988).

Due to perishability, the marketing channel for vegetables experiences more direct influence of the harvest schedules of the vegetable farmers,

than it does with staple foods. Staple foods can always be stored, but vegetable have directly to be send to the wholesale market for avoiding deterioration.

Vegetables have in general a shorter cycle length than staple foods. Therefore farmers have to contact traders more frequently than in the case of staple foods. But also farmers of vegetables face better opportunities to change their products in cultivation. This shift of product is also made easier by the relatively broad range of alternative vegetables, while with staple foods farmers have hardly any choice in the crops to cultivate.

Vegetables tend to be cultivated near, or around big cities. Isolated production areas would cause too much delay in the distribution to the cities. So traders, if they want, can easy visit their suppliers, and farmers on their turn can transport their product to the wholesale market (Nestel,1979).

Marketing characteristics

Because vegetables are highly perishable, quality becomes a risky element in the transactions. And often there doesn't exist some way of grading of the product (Tilburg,1981). For those reasons the product has to be physically present during the transactions. The personal quality examination, together with the broad range of products, causes that wholesale traders tend to specialize themselves on maximum three, or four different products. This situation won't benefit the retail traders, because they have to visit a lot of different wholesale traders to acquire their products. And because the retail trader also has to examine the quality personally, the acquisition of the vegetables becomes a highly time consuming activity, which has to be done very frequently, due to the perishability of the vegetables. All wholesale traders and a lot of retail traders obtain their products on a daily scheme (Harrison,1974).

The great number of small vegetable farmers around the city have to sell their product within short time limits. A result can be that delivery

of vegetables to the wholesale market is done through a lot of small trucks. Together with the frequently visiting retail traders and the relative great number of wholesale traders, the wholesale market becomes a densely populated and congested market place, where a lot of small transactions take place (Harrison,1974).

Another aspect in the vegetable marketing that is different from the staple food marketing, is for part of the strong price fluctuations. This is mainly caused by an irregular supply. Demand, however, reacts strongly on changing prices. This situation asks for another trade policy of the traders than in the case of staple foods, where they deal with a more inelastic demand and more stable prices. Their policy concentrates more on prices and quantities, while for vegetable traders, quality becomes an important tool in their trade policy.

Staple food marketing is often evaluated on its degree of interrelationships with markets in other regions (Lele,1971). This is hardly of interest for vegetable marketing, because distribution over large distances cannot be accepted for the resulting delay and deterioration.

The cost structure in the vegetable marketing also is different from the cost structure in the marketing of staple foods. Most of the staple foods undergo some processing, like milling, or drying. Furthermore, there are costs of storage. Transport costs on the other hand can be lowered down by looking for bulky transport, for example by train or by ship (Scott,1985; Coscia,1980; APO,1976; Sorenson,1975; Lele,1971). Vegetables on the contrary have to be transported directly and fast, which in most of the cases will signify transport by car (Tilburg,1981). Another cost factor in vegetable trade is for part of the many small transactions, which are highly time consuming and involve a lot of traders, of whom each of them has to earn a living out of it. Losses also will be a cost factor of more importance than in trade of staple foods. But on the other hand, there are no costs of storage, processing,nor grading (Janssen,1985; Forero,1983; Bromley,1981; Harrison,1974).

To realize a fast distribution of the vegetables, it is quite of interest to make some vertical coordination in the marketing channel (Janssen,1985; Forman, ?). Wholesale traders in Latin America, for example, go to the production area to buy the product there, in stead of waiting on the wholesale marketplace for what will arrive. As Harrison remarked, vegetable traders become active buyers, in stead of active sellers (Harrison,1974).

Staple food prices are often controlled by the government, for protecting farmer prices and/or consumer prices. Vegetable prices on the other hand are almost never regulated by the government. The first reason is that the product isn't of much importance to the national product, if compared to other products, and the second reason is that the tools, which are used for controlling staple food prices are not, or hardly useful for vegetables[1].

Conclusive remark

Research of consumption and urban marketing of vegetables has to deal with a lot of different issues, than the same kind of research for staple foods. In vegetable research some important issues are; quality and perishability, the importance of a fast distribution, degree of vertical coordination or integration, the high income and price elasticities of demand and strong fluctuations of supply and prices. Staple food research on the other hand deals for example with; intermarket relations between regions, effective storage of the product and possible speculation by means of storage, processing (costs), imports and government price policy. What

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1) Some traditional tools in price policies have been; regulation of the import/export of the target product; management of buffer stocks; fixed prices, threshold prices, or fixed price ranges; fair price distribution; rational distribution of surplus areas to deficit areas; price support by subsidies; government purchase at guaranteed prices (Pinstrup-Andersen,1985; Coscia,1990; APD,1976; Sorenson,1975; Lele,1971).

also follows from above mentioned differences is that information about
consumption levels, prices, product flow, etc. of vegetables are highly tied
to the moment of data collection. Production prices vary enormous (annex I),
much more than in the case of staple foods. Together with the high price
elasticity of demand, the consumption of vegetables is far from steady in
time.

2   THE CAPITAL OF COLOMBIA AS A RESEARCH AREA

2.1   Characteristics of the city

Bogotá is a medium-sized metropolis, with almost four million inhabitants in the year 1985[1], and a population growth of 3,4% (DAPD,1986). It shows the same kind of organizational problems as often seen in fast growing cities in Latin American countries; such as shortage of suitable housing for everybody, low level of maintenance, slow improvements to the infrastructure and being in arrear with the provision of public services, (water supply, electricity and telephone connection, sewerage, and refuse collection). Mean income in Bogotá, compared to other urban areas in Latin America, is around the average. As a whole, Bogotá can be seen as a representative urban area for Latin American countries. Because urbanization, gross domestic product and per capita food supply are significantly higher in Latin America than in Asia or Africa, generalizations outside Latin America have to be made with care (Pachico,1987).

Bogotá was chosen for the study partly for its representativeness and also because an important production area of snap beans exists around the city. Thus product flow up to consumers can be more easily monitored.

2.2 Consumption

The cultivation of different crops is to a greater or lower extent linked to climatic conditions. Climate, however, varies a lot for the different departments of Colombia. This means that consumption of, particularly, vegetables, which cannot be transported over large distances because of perishability, is also tied to those climate differences. The most important vegetables in Bogotá are snap beans, tomatoes, carrots, fresh peas and onions.

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1) Source: Colombia Censo '85, Vol 1, julio de 1986, XV Censo Nacional de población y IV de vivienda.

Snap beans are mainly consumed in lunches and to a lesser extent in dinners. It is common for the people in Bogotá to take lunches and sometimes dinners outside the house, in cafeterias or restaurants. The most common form of preparation is to add cooked, sliced snap beans to a vegetable soup, together with many other vegetables (see Ch. 5.2), but only a few spoonfuls of sliced snap beans are added to one, or two liters. Snap beans are also very commonly prepared in a dish, together with rice, a piece of meat, a potato and a fried plantain. For the dish, snap beans are sliced into little pieces, cooked and mixed with milk, flour, butter and sometimes an egg. Sometimes vegetables are mixed together, for example, snap beans, carrots, peppers, and peas. Other times snap beans are mixed with pieces of chicken meat. A third, but less common way to use snap beans in consumption, is in salads. The base for a salad are onions and tomatoes. To these vegetables, other vegetables can be added like, red beets, cabbage, snap beans, carrots and fresh peas. When salads are prepared, they largely replace the cooked hot vegetables in the dish.

2.3 Market structure

Retail marketing

There are several outlets, where snap beans can be obtained. There are the market places, neighborhood shops, supermarkets and mobile markets. Also restaurants can be seen as a form of retail trade. Table 1 shows the total number of each type of retail trader, according to estimations from this study.

Market places and neighborhood shops are the two traditional retail outlets. Neighborhood shops have very limited market areas, for which it is difficult for them to manage more than a small, restricted assortment of the major selling vegetables. Their popularity comes from the fact that they are nearby. Market places, on the other hand, are more specialized in perishables and serve big market areas. They are popular for their extended product ranges within the perishables, and for their low prices (Harrison,1974).

Table 1   Number of snap bean retail traders in Bogotá, dec. '87.

Market stall holders	21.564
Neighborhood shop owners	5.932
Restaurants	3.048
Stall holders on CORABASTOS	3.021
Supermarket stores	962
Stall-holders in mobile market organizations	80
Number of families per snap bean retailer	23

Within the group of supermarkets, there are a lot of individual supermarkets and five supermarket chains. The reason that supermarkets are appreciated, is that they are clean and that they manage broad product ranges for all kind of foodstuffs.

The mobile market is a system in which groups of traders have markets of different places in Bogotá on a weekly scheme. Prices are fixed, or set to a maximum. The system of mobile markets is still quit new in Bogotá. The oldest one is managed by the central wholesale market, CORABASTOS, and has existed for about seven years. The second mobile market organization, COOMERCUN, is a cooperative of retail traders and is about five years old. The third one, MERCASO, is a private enterprise, which is about three years old. They do not differ very much from each other in their trade policy. They all deal with the same product groups; vegetables, fruits, meat and poultry, fish and dairy produce. CORABASTOS works with fixed prices, while COOMERCUN and MERCASO have maximum prices. The prices are shown to the public in, or near the stands. Only CORABASTOS does some promotion, through a weekly publication of the prices in a newspaper. COOMERCUN and MERCASO both have active location policies, which means that they themselves look for, possible new locations. CORABASTOS on the other hand wait for the demand for their market services. The popularity of the mobile markets is still growing, particularly because of their clean appearance, and low, fixed prices.

Wholesale marketing

Most of the retailers buy their snap beans in the central wholesale market, CORABASTOS, which has now been in existence for some 18 years. CORABASTOS is located on the outskirts of the city, where some 140 wholesale traders operate for snap beans.

The supermarket chains, on the other hand, do not obtain their vegetables via CORABASTOS. Some have their own providing channel, that starts in the surrounding production area, and some are supplied by private enterprises, which specialize in fruit and vegetable provision. The supermarket chains keep CORABASTOS in reserve for when their own supply is insufficient.

3   THE DESIGN OF THE SNAP BEAN CONSUMPTION AND URBAN MARKETING RESEARCH

In chapter 1, the different issues regarding vegetables versus staple foods have been described. The consequent hypotheses, which are mentioned below, were part of the research.

3.1   The hypotheses

One of the first necessities of food is to fill the stomach and to give energy, which can be fulfilled by the consumption of staple foods. Vegetables, however, are appreciated for taste, vitamins and minerals.

1. Thus, consumption of vegetables/snap beans per capita will be lower in the low socioeconomic strata, as compared with consumption of vegetables/snap beans in the higher strata.

2. The vegetables consumed in the low socioeconomic strata will mainly be the "heavier" vegetables, like dry and fresh peas, dry and fresh beans, "haba verde" (a type of a broad bean), carrots and "ahuyama" (actually a fruit). The vegetable consumption in the higher strata will, to a large extent, be composed of more "watery" products, like spinach, lettuce, cucumber, and to a lesser extent, snap beans.

3. In the lower socioeconomic strata consumers will prefer mature snap beans to thin snap beans, while the consumers of the higher strata will do the opposite.

In the low socioeconomic strata, consumers prefer low prices to quality, while the consumers in the high strata put quality above low prices. This means that people from the low strata will buy products of lower quality, if they are cheaper.

4. For this reason, snap beans of low quality will find a better entrance to consumers in low socioeconomic strata, than in the high socioeconomic strata, if they are put on a lower price.

5. New varieties of snap beans, or snap beans with new, different characteristics, will be accepted first in the low socioeconomic strata, if the price is put below the price of the common variety.

Perishability is an important characteristic of vegetables, and depends strongly on the quality of the product. Because people of the low socioeconomic strata buy more vegetables of lower quality, they will have bigger problems keeping their vegetables fresh for longer time.

6. This will result in bigger losses of vegetables in the low socioeconomic strata.

7. To economize on time, fuel and maybe also on food, people of the low socioeconomic strata will prepare their food/snap beans for more than 1 meal at a time. People of the high socioeconomic strata, on the other hand, will prepare a new meal each time.

8. The explanation of consumption levels of vegetables/snap beans in the low socioeconomic strata depend heavily on socioeconomic factors, i.e. household expenditures, family size, education level of the housekeeper, mean age of the household, age of the housewife, transport costs for buying the vegetables and the socioeconomic stratum. In the high socioeconomic strata, consumption levels of vegetables/snap beans is influenced to a greater extent by attitude.

Because consumption of vegetables in low socioeconomic strata is lower than in high socioeconomic strata, the total sales will also be less.

9. For this reason, fewer traders will be attracted to areas of low socioeconomic strata (and this will result in a lower availability of vegetables in those sectors), and/or traders will have smaller sales in sectors of low socioeconomic strata.

Consumers from the low socioeconomic strata prefer to buy cheap vegetables to vegetables of good quality, while consumers from the high socioeconomic strata do the opposite.

10. The result is that the former buy in cheaper outlets, like market places, while the latter buy in more expensive outlets, like supermarkets.

Quality is strongly related to perishability and is therefore an important risk factor in buying and selling transactions.

11. For this reason only a few traders will dare to manage low prices at the expense of good quality. This will also decrease the availability of affordable vegetables/snap beans in the poorer areas.

Risk increases according to the degree of specialization in the assortment in a certain link in the market channel (for example the wholesale market).

12. Because of the higher risks, there will be a lower degree of free entry.

13. According to the higher risks, one will also find higher margins between buying and selling prices.

As said in chapter 2, consumption also take place in a lot of restaurants. In the competition between home consumption and restaurants, and within restaurants prices form an important tool.

14. To offer cheap meals, restaurants will be less exigent on the quality of snap beans than housewives.

15. Also they will offer smaller portions of snap beans than is done in house consumption.

3.2 The methods in the study

Consumption

The information about consumption was obtained through inquiries at 120 households. The households were visited at random,having stratified by selecting neighborhoods with different living standards. Six levels of living standards were distinguished (DAPD,1986). Four neighborhoods were selected at each level of living standard and in each neighborhood, five households were visited.

The inquiry included among other things; questions about quality, in which the respondent had to choose between given answers; recall questions about consumption, buying quantities and product losses, with a period of one week (Raj,1972); and open questions on expenditures, education level and other socioeconomic factors.

The inquiry also included a new, rapid, inexpensive survey method to obtain information about preferences, using photos that were shown to the respondents. Each photo showed two or three different snap beans with different prices so that a snap bean of the common type, good quality and a fixed price of $60.oo per half kilo had to be compared with a snap bean of different quality, or with new characteristics and with a price of $50.oo per half kilo[1]. The respondent was asked which one they would buy, if they were to find those two, or three different snap beans at the market place, supermarket, or neighborhood shop at prices, shown on the photo. In annex V some of the photos are shown.

Marketing

As shown in chapter 2, there are several channels for snap beans in urban marketing. At the retail level, visits were made at neighborhood shops, public market places, mobile markets and supermarkets. Restaurants can also be seen as part of retail trading. The total number of visited retail traders were 60 (table 2). The neighborhood shops in this study came from the same neighborhoods that were selected for the consumption inquiries. There was no shop in four of those neighborhoods, so the total number became 20. The market places that were visited came from a list of public market places, managed by EDIS (Empresa Distrital de Servicios Publicos). No more than one market stall-holder per market place was interviewed. The interviews with the mobile market traders took place within all the three operating organizations. The restaurants that were visited, were selected so that they were from all areas of Bogotá, with some concentrations in commercial and industrial areas.

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1) At the time of the study, U.S.$ 1.oo was about Col.$ 265.oo.

From the five supermarket chains in Bogotá, the two with the biggest number of stores were interviewed.

At CORABASTOS, five wholesale traders of different size (for daily quantities) were interviewed.

An attempt was made to obtain the same kind of information about quality as was collected through the consumption inquiries. The inquiry method was based on open questions with the freedom of making open discussions.

Table 2   Total number of interviewed traders in the study.

Restaurants	20
Neighborhood shops	20
Mobile market traders	9
Market stall holders	11
Supermarket chains	2
Wholesale traders	5

4   SNAP BEAN MARKETING IN BOGOTA

4.1   Wholesale trade

Almost all the wholesale traders on CORABASTOS work seven days a   week. A wholesale trader sells on an average 1800 kg. snap beans a day. On this base it is estimated that there are 144 wholesale traders operating in the snap bean market. The smaller wholesale traders, who deal in about 600 kg. per day, buy almost all their snap beans on CORABASTOS, while the bigger wholesale traders tend to buy more on the market places in the production area, or even at the farms. The reason for the big wholesale traders to buy in the production area is to assure their volume. The reason for the small wholesale traders to buy on CORABASTOS, on the other hand, is to wait as long as possible for obtaining the latest price information, which in fact comes for a great deal from the big traders. As a result, about the half of all snap beans are bought on CORABASTOS and the other half in the production area.

The selling price is most often the buying price plus a fixed margin. The wholesale trader said that the margins were on a average $ 13.oo per kg.. Data of buying and selling prices, collected by CECORA (Central de Cooperativas del Sector Agropecuario Ltda.), indicate same margins. Average margins for snap beans from Fusagasuga in 1987 were $ 12.20 per kg. and for snap beans from the "orriente" $ 13.oo per kg. (see annex I).

It happens that the product cannot be sold on the same day of buying it. At the most the product can be hold on CORABASTOS for three or four days, but with price reductions of 40%. Some 30% of the clients of wholesale traders are regular clients.

Table 3 shows costs of a wholesale trader, who buys his snap beans only on CORABASTOS. It shows relative high costs for losses of the product.

Table 3   Average costs of wholesale traders in snap beans, Bogotá, jan.'88.

	$ per day	$ per kilogram
Loading and unloading	1.500.oo	0.80
Place at CORABASTOS	140.oo	0.10
Losses of the product	3.780.oo	2.10
TOTAL	5.420.oo	3.oo

In table 4 some general information is given about characteristics of wholesale traders. Almost all wholesale traders came in the business via their parents.

Table 4   Characteristics of wholesale traders, Bogotá, jan.'88.

	mean	mean, corrected for quantity
Years in business	17,5	25,0
Hours of working	6	6.45'
Age	35,6	48,6
Years of education	9	9

4.2 Neighborhood shops, market places and mobile markets

Table 5 shows some characteristics of retail traders from three different types of outlets; neighborhood shops, market places and mobile markets. Years of education and years of experience are both the highest for mobile market traders and the lowest for neighborhood shop owners. It is more frequent that parents were also traders for mobile market traders and

market stall holders, than it is for neighborhood shop owners. It seems easier to open a neighborhood shop than to start a commerce on a market place, or in a mobile market system.

Table 5   Characteristics of three different types of retail traders, Bogotá, dec.'87-jan.'88.

	Neighborhood shop owner	Market stall holder	Mobile Market trader
Age	37	38	34
Years of education	6,5	6,5	10,0
Years in retail business	3,9	9,5	13,5
Years on actual place	3,1	-	2,2
%-age of whom parents were traders	24	55	45
Number of working/market days	7	7	4
Buying frequency (times/week)	3	5	4
%-age that buys regular on CORABASTOS	90	100	100
time on CORABASTOS (hr.min')	2.46'	2.08'	2.11'

The reasons, most often mentioned, for managing a neighborhood shop are; its ease to combine it with other home work, like feeding up children, housekeeping and studying; the good returns; and the independence of the work. The reasons, most frequently mentioned for market traders (market stall holders, as well as stall holders in a mobile market system) are; casualness, independence, good returns, and knowledge of trading before hand.

Table 6 and 7 show daily buying volumes, costs, number of personnel and margins of different vegetables for three different types of retail outlets. Although a mobile market trader has the biggest sale volumes, he also has to deal with the highest costs. Margins for snap beans are more or less equal for the different outlet types.

Table 6   Daily buying volumes of the different vegetables (kg.) of three different types of retail outlets, Bogotá, dec.'87-jan.'88.

	Neighborhood shop owner	Market stall holder	Mobile market trader
DAILY BUYING VOLUMES:			
Cabbage	1,5	2,9	27,3
Red beets	1,0	6,9	37,3
Spinach	0,1	0,5	2,0
"Ahuyama"[1]	1,8	5,8	43,8
Potato	2,1	73,7	143,8
Cucumber	0,9	11,5	33,5
Lettuce	0,1	0,8	6,7
Carrots	4,5	24.4	62,5
Fresh peas	4,7	37,9	75,0
Fresh beans	1,2	21,0	21,9
Snap beans	4,6	43,7	50,0
"Haba verde"[2]	1,3	6,9	43,8
Tomato	8,3	24,2	95,4
Green onions	3,0	25,6	75,1
Common onions	3,0	26,1	45,4
Cauliflower	0,1	0,6	10,1

1) "Ahuyama" is actually a fruit

2) "Haba verde" is a type of broad bean

Table 7   Costs,   number of personnel and margins of three   different types
          of retail outlets, Bogotá, dec.'87-jan.'88.

	Neighborhood shop owner	Market stall holder	Mobile market trader
COSTS ($/day):			
Costs of transport	214	655	7.400
Costs of product losses	43	203	1.302
Costs of public services	330	-	-
Costs of rent	489	-	-
Costs of place on the market	-	110	2.079
Costs of personnel	375	145	8.554
TOTAL COSTS	1.451	1.113	19.335
NUMBER OF PERSONNEL:	0,4	0,4	8,8
MARGIN:	13,4	13,0	13,8

4.3 Supermarket chains

Two types of snap bean supply by supermarket chains will be described.
The concerning supermarket chains are CARULLA and CAFAM.   They are the two
chains that have the biggest number of stores in comparison to the other
chains.

CARULLA has his own delivery system, in which they buy directly from
farmers, or farmer organizations. CAFAM on the other hand, has contracted
out the vegetable trade in its entirety to a distribution enterprise, called
SARJO. SARJO does the buying, transporting and delivery to the individual
stores in a comparable way as CARULLA[1] (Dijken,1988).

CARULLA sells about 325 tons per year and SARJO-CAFAM about 300 tons per year. Consumer prices are daily adjusted[2]. Annex II shows the average selling prices per month for both concerns.

The marketing policy of both concerns isn't one of sharp prices, but one of good quality. Severe control of the products is done before they can be sold in the individual stores. Furthermore, vegetables are only accepted, if they are put up in plastic boxes, which can be bought, or borrowed from the concerns. When the vegetables arrive in Bogotá, they are stored in cold storage chambers. The high attention for quality, together with the own supply channel, make that there are hardly problems with product decay.

Both, SARJO and CARULLA, have some experiences with trading different varieties of snap beans. SARJO has tried a yellow snap bean, but they stopped with it, because the yellow beans sold very bad. It must be noted, however, that SARJO fixed the consumer price of the yellow snap beans above the consumer price of the common variety. Neither they did any promotion for the new variety. Both concerns show interest in new varieties to introduce them to the consumers as well as to the farmers, with whom they cooperate.

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1) CAFAM only takes care of the personnel in the stores, who sell the vegetables at prices fixed by SARJO. CAFAM therefore shares in the profit of SARJO.

2) In the individual stores only one quality can be found for snap beans. There are other vegetables, for which both concerns offer sometimes two qualities with different prices, like for fresh peas and carrots. Prices are the same in all the individual stores.

4.4   Restaurants

All restaurants prepare lunches, as it is the most important meal of
the day, and 45% of the restaurants also prepare dinners. The mean number of
clients per restaurant per day (for lunches and dinners) is 98[1]. Total
number of restaurants in Bogotá is estimated to be around 3048[2].

Table 8 shows the frequency and the quantity of snap beans in
consumption. The mean consumption of a client is 122 grams of snap beans per
week.

Table 8   Mean quantity and mean number of preparations of snap beans in
          restaurants, Bogotá, jan.'89.

	Number of preparations	pounds per week	pounds per time	gr/head
Soup	4,0	6,0	1,5	31
Dish	1,7	13,2	7,8	67
Salad	1,1	4,7	4,3	24
TOTAL		23,9		122

Table 9 shows mean quantities of the different vegetables that
restaurants buy per week. Total volume of snap beans that pass through the
restaurant channel is (12,5*3048=) 38.100 kg. per week.

_____

1) For the lunch a restaurant has to deal with a mean of 92 clients per day,
   which, however, varies from 15 to 400. For dinner a restaurant has to
   deal with less people, a mean of 36 people per day.
2) 7,5% of the lunches and dinners are taken outside the house, so that
   total number of restaurants then will be 0,075*3982941/98 = 3048.

Table 9 Mean quantities of vegetables that restaurants buy per week,
          Bogotá, jan.'88.

Product	kg.	Product	kg.
Cabbage	2,5	Fresh bean	12,4
Red beet	7,7	Dry bean	16,3
Spinach	1,9	"Haba verde"[2]	3,9
"Ahuyama"[1]	9,6	Snap bean	12,5
Potato	220,2	Tomato	36,4
Cucumber	16,3	Green onion	14,3
Lettuce	4,1	Common onion	9,1
Carrot	14,1	Lentil	7,2
Fresh pea	7,2	Cauliflower	11,0
Dry pea	19,7		

1) "Ahuyama" is actually a fruit

2) "Haba verde" is a type of broad bean

The most important outlet of vegetables for restaurants are the market
places. Table 10 shows where restaurant owners buy their vegetables, and
bought if the have changed buying place in the past. Reasons in the choice
of vegetable outlets are particularly for part of low prices and short
distances. To a less extend, fresh products, good quality, and the
possibility to buy all other necessary products in the same place, were also
reasons in the outlet choice. From the restaurant owners, who changed outlet
in the past, it seems that market places then were even more important. The
reason to have bought on market places in the past is for part of low
prices. Possibly this reason is becoming less important.

Table 10 Vegetable outlet choice of restaurants, Bogotá, jan.'88.

	%-age of restaurants	
	Present day situation	Past day situation
CORABASTOS - wholesale	15	-
- retail	20	5
Mobile market	5	-
Supermarket	20	5
Market place	40	5
Not applicable	-	65

Table 11 shows the average costs for restaurants. Mean number of personnel (cooks and servants) is 3,4 per restaurants.

Mean number of years, that the present day restaurants exist, is 3,5. However, 44% of the restaurants exist less than one year. Education level of restaurant owners is on an average 10,3 years.

Table 11 Mean costs of restaurants, Bogotá, jan.'88.

	$/day
Food	6.825
Rent and public services	1.911
Transport	275
Salary	2.458
TOTAL	11.469

4.5 A final remark

Table 12 makes it possible to compare the different individual traders on some characteristics. Apart from trading practices, and other marketing conduct aspects, these data suggest that it is harder to start in wholesale trade, in mobile market trade, or a restaurant, than it is to open a neighborhood shop, or start in a market place.

Table 12 A comparison of five different individual traders on some characteristics, Bogotá, dec.'87-jan.'88.

	Wholesale trade	Neighborhood shop	Market place	Mobile market	Restaurant
Age	36 (49)[1]	37	38	34	?
Years of education	9 (9)	7	7	10	10
Years in business	18 (25)	4	10	14	?
Years on actual place	18 (25)	3	?	2	4
Costs ($)	5.420	1.451	1.113	19.335	4.644

1) Between parentheses; mean corrected for quantity

5   CONSUMPTION OF SNAP BEANS IN BOGOTA

5.1 Characteristics of the households

Some characteristics of the households, split up by socioeconomic stratum, are shown in table 13. Household size is about five people, which is more or less equal for the six socioeconomic strata. The members, younger than 15 years, however, differ significant between the six strata. The lowest two socioeconomic strata are characterized by more children within the household than the two middle strata. The two middle strata are on their turn characterized by more children within the household than the highest strata. Accordingly, mean age of the household members is the lowest in the two lowest socioeconomic strata, and the highest in the two highest strata. Also there is a clear division in education level of the

Table 13 Characteristics of the households, Bogotá, dec. '87.

| | Stratum | | | | | | | |
	I	II	III	IV	V	VI	Mean[1]	F(0,95)
Number of participants[2]	5,5	5,4	4,4	5,7	4,5	5,0	5,0	—
Number of participants younger than 15 years	2,0	2,3	2,0	1,3	0,7	1,0	1,6	3,49
Mean age of the household	23	26	27	31	35	32	29	3,59
Age of the housekeeper	40	43	43	48	49	46	45	—
Years of education of the housekeeper	4	5	8	8	12	13	9	[3]
Years in Bogotá	23	17	27	26	20	32	25	—

1) Mean corrected for population per stratum

2) Number of participants corrected for the meals taken outside the house

3) $X^2(0,95) = 83,4$

housekeeper. Years of education is the fewest in the lowest strata, next the two middle strata and years of education is the most for the two highest socioeconomic strata.

5.2 Snap bean consumption patterns

Consumption of snap beans in Bogotá was in the month December '87 1.815.840 kg. per week. As shown in table 14, the average snap bean consumption per capita is 483 grams per week. Soup provides most of the consumption of snap beans, next dishes and the last salads. Frequency of consumption is divided significant different among the strata. In the two lowest socioeconomic strata, people consume less frequently than in the

Table 14 Snap bean consumption patterns, Bogotá, dec.'87.

	Stratum							
	I	II	III	IV	V	VI	Mean[1]	F(0,95)
Frequency of con- sumption per week:								
Soup	3,20	3,40	2,95	3,05	2,05	1,65	2,88	-
Dish	1,00	0,95	1,75	2,45	1,75	1,75	1,94	2,64
Salads	0,50	0,70	0,35	1,40	1,35	0,70	0,87	-
Consumption level of snap beans per capita per week (gr.):								
Soup	135	97	421	125	110	126	250	
Dish	115	116	102	162	140	179	130	
Salad	53	43	114	102	110	84	103	
TOTAL	303	256	637	389	360	389	483	

1) Mean corrected for population per stratum

other four strata. The quantities of snap beans per household per week, however, are not different between the strata. So, if people from the lowest strata consume less frequently, than they must consume bigger portions per time. Furthermore, people consume more than one time of the prepared snap beans, which is equal for each socioeconomic level. For soup this is 1,3 times, for dishes 1,5 times and for salads 1,2 times.

Alternatives for snap beans in consumption

Substitutes of snap beans differ for the way of preparation. The most important substitutes are shown in table 15.

Table 15 Substitutes for snap beans (%-age of respondents, who mentioned the product as a substitute), Bogotá, dec.'87.

Vegetable	Consumers			Restaurants		
	Soup	Dish	Salad	Soup	Dish	Salad
Cabbage	17	10	51	30	10	60
Red beet	2	10	75	10	10	75
Spinach	46	35	8	60	30	10
Potato	56	59	9	40	5	10
Spaghettis	44	62	-	25	95	-
Cucumber	-	4	44	10	20	60
Carrot	59	43	67	55	10	65
Fresh pea	43	53	23	55	65	25

5.3 Vegetable purchasing habits

Snap bean consumption cannot be looked at without realizing the importance of other vegetables. As can be seen in table 16, snap beans belong to the group of most consumed vegetables. Purchased quantities of some vegetables differ between strata. Those vegetables are tomato, carrot,

onion, fresh pea, "haba verde" and lentils. All those vegetables, except "haba verde" and lentils, show significant higher consumption levels in the group of highest strata and lower consumption in the group of lowest strata. "Haba verde" consumption also is lower in the group of lowest strata, but highest in the group of middle strata. Lentil consumption is the lowest in the middle and high strata and the highest in the group of the two lower strata. The other vegetables are neutral for part of consumption in the

Table 16 Purchased quantities of the different vegetables in grams per capita, per week, Bogotá, dec.'87.

Product	Mean[1]	$F_2(0,90)$[2]	Product	Mean[1]	$F_2(0,90)$[2]
Papa	1430	-	Cucumber	142	-
			Spinach	120	4,86
Snap bean	511	-	Cabbage	97	-
Tomato	505	2,50			
Carrot	431	2,41	Lettuce	57	6,36
Onion	428	3,18	Dry bean	45	-
Fresh pea	336	3,77			
			Dry pea	28	-
"Ahuyama"[3]	180	-	Lentil	22	2,44
Fresh bean	175	-			
"Haba verde"[4]	173	-	Cauliflower	7	-
Red beet	169	-			
Spaghettis[5]	167	-			

1) Mean corrected for population per stratum
2) F-value of consumption per household for three levels of socioeconomic strata; low, middle and high, which are groups of the original socioeconomic strata, 1+2, 3+4 and 5+6.
3) "Ahuyama" is actually a fruit
4) "Haba verde" is a type of broad bean
5) Although spaghettis aren't vegetables, they are often used as alternatives for vegetables (see Chapter 5.4)

different socioeconomic strata. Purchased quantities per capita per week, within each stratum, are given in annex III. Total quantities of vegetables, bought in one week in Bogotá, can be found in annex IV.

The consumption of fresh vegetables (= all vegetables in table 16 less potato, spaghettis, dry bean, dry peas and lentils) is the lowest in the group of low socioeconomic strata (1+2) ant the highest in the group of the two middle strata (3+4). The F-value is however low, 1,87. If the above mentioned vegetables are also included, than the consumption of vegetables is almost the same in the group of the two lowest strata and the group of the two highest strata. The consumption in the middle group, however, is almost the double of one of the other groups. The F-value (2,59) is significant at 90% probability.

Outlet choice for vegetables

Most consumers buy their vegetables on the market places. Table 17 shows that neighborhood shops are particularly of importance for the lowest socioeconomic stratum. The supermarket on the other hand is where most of people of the highest stratum buy their vegetables, while the people of the intermediate strata buy particularly on market places. Above mentioned percentages can be used to calculate volumes of snap beans that are bought in the different outlets. As shown in table 18, market places then take almost the half of all sales of snap beans on their account. The reasons behind the outlet choices can also be found in table 17. Freshness with good quality is the reason of most importance in the group of high strata and less in the group of low socioeconomic strata.

The distances to the usual outlet isn't different for the consumers out of the different socioeconomic strata.

That certain types of snap bean retail outlets serve people of a particular socioeconomic stratum, can also be shown in another way. For some of the snap bean retail outlets, it was possible to calculate a mean

for the socioeconomic strata of areas in which they are established. This is shown in table 19. The outcome confirms the consumer information about outlet choice.

Table 17   Vegetable purchasing habits, Bogotá, dec. '87.

	Stratum							
	I	II	III	IV	V	VI	Mean[1]	
Outlet choice of consu-mers for vegetables:								
CORABASTOS	15	15	-	20	15	15	10	
Mobile market	-	-	-	10	10	5	5	
Market place	20	45	55	30	40	10	43	
Neighborhood shop	55	25	25	20	5	-	20	
Supermarket	10	15	20	20	30	70	22	
								$X_2^2(0,95)$[2]
Reasons for buying in a certain outlet:								
Cheap	30	65	40	50	40	20	45	-
Fresh and good quality	35	70	80	65	70	90	73	8,0
Credit	-	-	5	-	-	-	2	-
Buy everything there	20	15	25	10	15	15	19	-
Near	55	45	30	45	45	15	38	-
Purchasing frequency	1,89	1,78	1,83	1,85	1,13	1,10	1,74	[3]

1) Mean corrected for population per stratum

2) X^2-value for three levels of socioeconomic strata: low, middle, and high, which are groups of the original strata, 1+2, 3+4 and 5+6.

3) F-value for three levels of socioeconomic strata = 3,65

Table 18 Total sale volumes of snap beans per week for the different types
of outlets (kg/week), Bogotá, dec.'87.

		Outlet			
Stratum	CORABASTOS	Mobile market	Market place	Neighbor- hood shop	Super- market
I	163	-	218	599	109
II	8704	-	26111	14506	8704
III	-	-	712372	323805	259044
IV	99446	49723	149169	99446	99446
V	19331	12888	51551	6444	38663
VI	4373	1458	2915	-	20407
TOTAL	132017	64068	942335	444800	426372
%-age	7	3	47	22	21

Table 19 Mean socioeconomic stratum of the sectors in which different
types of retail outlets are established, Bogotá, dec.'87-jan.'88.

	Mean[1]
Neighborhood shop	2,7
Market place	3,9
Mobile market: CORABASTOS	4,6
MERCASO	4,7
COOMERCUN	5,3
All three	4,8
Supermarket chains: CAFAM	4,7
CARULLA	5,6
Both	5,1

1) Mean corrected for population per stratum

6   QUALITY OF SNAP BEANS

6.1 Quality examination

For the common snap bean, good quality means that the pod must be
emerald green, mature (but not overripe, in which the seeds are becoming
dry), and without dark spots, or rotten parts. Furthermore, a snap bean of
good quality is long, snaps easy, and has a straight and regular form. Those
criteria are not of equal importance within the market channel, as shown in
table 20. Consumers pay most attention to the color, the absence of dark
spots, or rotten parts, and maturity. The form on the other hand is of less
importance. Consumers from different socioeconomic stratum do not differ in
their quality examination. Restaurants owners tend to examine in the same
way as consumers, but with a little less attention to length and form of the
pod. Remarkable is the low percentage of market traders and shop owners, who
say to pay attention to the absence of spots and rotten parts. However, most
likely, spots and rotten parts are so important, that the presence of these
defects is out of the question. Furthermore, it is striking that the form of
the snap beans are of so little importance for market traders and shop
owners. The latter also pay hardly attention to the length of the pod. The
wholesale traders on CORABASTOS examine quality on the same criteria as the
retail traders and consumers. But in addition they also set high value on
the length of the snap bean. Form of the snap beans can vary a little bit
more, as also is the case for the retail traders and consumers.

The four most occurring defects in quality for the consumers are decay,
a pale green color, spots and flexibility. These are also the defects on
which they most often check on. As appears in table 20, retail traders
experience less defects in quality. This is logic, because they obtain the
snap beans earlier in time than consumers. It is striking that retail
traders meet hardly defects for part of the easy breaking of snap beans,
while this is a very frequent defect for consumers. On the other hand,
retail traders mention more often overripeness as a defect, while this isn't
so important for consumers. The most common defects, for wholesale traders
are the spots, overripeness and small length.

Table 20 Quality aspects of snap beans (%-age of respondents), Bogotá,
         dec.'87-jan.'88.

	Consu-mers[1]	Restau-rants	Market places and mobile markets	Neighborhood shops
Criteria in quality examination:				
Color	96	100	95	75
Disease and decay	94	100	15	20
Maturity	92	95	100	70
Length	74	50	55	5
Easy breaking	69	85	80	65
Form	58	35	5	-
Most frequent defects in quality:				
Decay	97	25	35	45
Pale green/yellow[2]	87	60	50	55
Dark spots	82	70	35	35
Flexibility	79	25	15	-
Overripe	34	60	70	40
Sample size	120	20	20	20

1) Mean corrected for population per stratum

2) Yellow is an indication for staleness

6.2 Acceptance of quality defects

The severity for part of the defects may differ between the type of
meal for which the snap beans are used. This is shown in table 21 for
consumers, as well as for restaurants. Generally more people accept some
kind of defect on the snap beans, if the snap beans are going to be used for

the soup. For the dish and the salads more people prefer to use good beans.
Furthermore it appears that restaurants on the whole accept more often some
quality defects than consumers.

A medium length of 8 to 11 cm. isn't a problem for any type of meal.
Less than eight cm. becomes more a problem. This is, because the snap .beans
are shelled before cooking. As long as the quantity, that has to be
prepared, isn't very much, people can accept small beans. But for dishes,
for which bigger quantities are prepared, it becomes a lot of work to deal
with so many small beans.

Concerning color of the snap beans, it can be noted that a snap bean
with a dark color is the snap bean that is most often accepted, without
difference for the meal for which they are used. A pale green color is
accepted to a less extent, particularly when it concerns the dish, or the
salad. Yellow snap beans are hardly accepted at all.

As for the form, curved beans are fairly accepted, particularly for
soups. This is equal in all socioeconomic strata. For dishes and salads,
curved beans are less accepted, particularly in the middle socioeconomic
strata. The same is true for snap beans that has some kind of deformations
on the pod, although the acceptance on the whole is lower than for the
curved beans.

Maturity, as is shown in table 20, is an important quality aspect for
consumers, which particular concerns the overripeness. As a result young
thin snap beans are accepted to some extend, but overripe beans aren't
accepted at all. As overripe snap beans don't break easy, people don't
accept flexible snap beans.

Dark spots, as well as some decay are defects, that are out of the
question in acceptance.

In summary, dark green snap beans and snap beans of medium length are
accepted by most of the people. Pale green snap beans, short snap beans,

Table 21 Acceptance of quality defects by consumers and restaurants, Bogotá, dec.'87-jan.'88.

Defects	Consumers[1]			Restaurants		
	Soup	Dish	Salad	Soup	Dish	Salad
Medium length (8-11 cm.)	100	100	100	100	89	94
Dark green color	75	77	75	56	53	50
Curved bean	60	47	46	81	58	50
Small length	45	36	43	63	42	44
Pale green color	41	30	34	50	47	25
Thin bean	38	37	30	50	32	38
Deformed bean	37	25	23	44	37	25
Yellow color	8	3	3	6	-	-
Flexible beans	7	10	8	31	18	27
Overripe beans	1	2	1	6	5	6
Dark spots	-	-	3	19	5	-
Some decay	-	-	-	6	-	-
Sample size	117	118	99	16	19	16

1) Mean percentages corrected for population per stratum

curved snap beans, deformed snap beans and young, thin snap beans are moderately accepted. Hardly or not accepted are the yellow snap beans, snap beans with dark spots, snap beans, that are a little bit rotten, overripe snap beans and flexible snap beans. Almost no difference exists in acceptance of quality defects, between the socioeconomic strata.

6.3 Perishability and losses

Perishability and quality are closely related. Losses are caused by perishability, but also by the regularity of sales. As shown in table 22,

the biggest losses occur on the market places and in the neighborhood
shops. Losses on consumer level, as well as in restaurants, are negligible.
The products that demonstrate high risks, are spinach and lettuce. But also
cucumber, snap beans, and carrot are far from easy to deal in. Less but
still high are losses for fresh peas, red beets, "haba verde", and to a less
extent also tomatoes.

Table 22 Perishability and losses: Maximum conservation time (days) by
consumers and losses as a percentage of total purchase for
consumers and individual retail traders, Bogotá, dec.'87-jan.'88.

	Consumers			Losses (%)		
	Max. con-servation time (days)	Losses (%)	Restaurants	Mobile Market	Market Place	Neighbor-hood shop
Spinach	3,6	3	1	4	73	48
Lettuce	3,8	-	-	1	-	71
Fresh beans	4,2	-	0,1	-	1	4
"Ahuyama"[1]	4,3	-	-	-	-	-
Cauliflower	4,3	-	-	5	-	-
Fresh peas	4,4	-	2	1	11	20
Cucumber	4,4	-	-	-	2	48
Tomato	4,5	-	0,5	13	5	7
Snap beans	4,5	1	3	4	18	43
Carrots	4,7	1	0,5	-	16	31
"Haba verde"[2]	4,7	-	-	-	20	9
Cabbage	4,9	1	0,3	-	-	3
Red beets	5,1	-	1	-	16	21
Onions	5,2	-	-	3	-	4

1) "Ahuyama" is actually a fruit

2) "Haba verde" is a type of broad bean

7   PREFERENCES FOR SNAP BEANS

An idea of preferences for quality versus prices was obtained by means of photos (see chapter 3.2). Table 23 shows the results of the first eight photos, in which each time snap beans had to be compared on quality and price differences. The six socioeconomic strata are grouped together into three main strata, high=stratum 5+6, middle=stratum 3+4 and low=stratum 1+2. The first thing, that can be noted, is that consumers in the lower socioeconomic strata, prefer low prices to common good quality requirements, to a much greater extent than consumers from the middle, or high socioeconomic strata. People from the higher socioeconomic strata are

Table 23 Quality versus price; preferences of consumers and restaurant owners, Bogotá, dec.'87-jan.'88.

| | %-age of respondents | | | | | |
| | Consumers | | | | Restau- | Market share of first |
	Low	Middle	High	Mean[1]	rant	trials[2]
Yellow	10	6	-	5	-	6,1
Pale green and thick	15	3	1	3	5	3,4
Dotted	15	5	6	6	10	5,5
Small	5	2	1	2	15	1,9
Broad and flat	30	3	17	7	15	5,9
Deformed	35	20	14	20	35	20,2
Curved	20	8	4	8	20	8,4
Spot of rust	5	-	1	-	-	0,3
Mean	17	6	6	7	13	

1) Mean corrected for population per stratum

2) Market share (%) of consumer and restaurant purchases

hardly sensitive for low prices. It can be that they indeed act according to the common good quality requirements, but also it can be that they prefer high prices as a security for buying good quality. Significant differences in preferences between the strata at the 95% probability level, were found for the ripe pale green snap bean, the snap bean with some deformations, and the flat broad snap bean. Furthermore it is clear that some kind of disease on the pod of the snap beans will not be bought by consumers, even if the price is $ 10.00 lower than for the common one.

The restaurants in general prefer low prices to good quality to a greater extent than consumers. The preferences for low prices have the same pattern to quality differences as it has for consumers.

Neighborhood shop owners also were asked, which of the varieties they prefer, if buying prices showed the same relative differences[1]. For the retail and wholesale traders, the question was a little bit different. For this the photos have been divided into two groups; one with new variety characteristics and one with beans of less quality. The traders were asked, which of the different varieties they would try and which they wouldn't. For the difference in quality the question was, if they traded sometimes in the beans of less quality. The results are shown in table 24. Because of the difference in the question, it becomes a little bit difficult to compare the data.

It seems that shop owners are not really progressive for part of new varieties. This is logic, because snap beans form only a very small part in their assortment. The retail market traders look quite open for some new varieties. The variety characteristics that they would try, are for part of the color and the form. When, however, the snap beans are small, the interest disappears. Wholesale traders only showed interest in the yellow variety and the flat, broad variety.

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1) According to the quantity unit of purchases, prices had to be changed. But the relative price difference between the two varieties always was the same; about 17%.

Table 24   Quality   versus   price;   preferences of   retail traders   (%-age of
respondents), Bogotá, dec.'87-jan.'88.

	Neighborhood shops	Mobile market traders + Market stall holders
Yellow	-	60
Pale green and thick	5	50
Dotted	-	40
Small	5	15
Flat and broad	10	35
Deformed	19	10
Curved	-	5
Spot of rust	5	5

As for the quality aspects it can be said that deformation in the pod
is less bad than when snap beans are curved, or have spots of rust. Snap
bean's with some deformations will be traded, the other two not. Almost all
the wholesale traders, however, do trade at times in deformed, curved, or
spotted beans.

There were also photos with maturity differences. On these photos, the
comparison had to be done on three different snap beans; a very thin one, a
ripe one and an overripe one. On the first photo, the prices were the same;
$ 60.oo. On the second photo, prices of the thin one and the overripe one
were changed to respectively $ 50.oo and $ 70.oo. The third photo showed the
opposite; the thin bean was $ 70.oo and the overripe bean was $ 50.oo. The
common ripe bean stayed all the time on $ 60.oo. The question was for all
the respondents the same. Only the wholesale traders were asked in a
different way. They were asked, which one they preferred and next, which
prices they would give for the three types of snap beans. The results are
shown in table 25.

Generally the ripe snap beans are preferred to the thin, or the overripe snap beans. However, at almost all levels, overripe snap beans are preferred to thin snap beans.

As for the consumers, three types of responses can be recognized. In the case, that the prices are all $ 60.00, there are more consumers in the low strata, who prefer overripe snap beans, than there are in the middle and the high strata. Thin snap beans are in the situation of equal prices out of the question. However, when thin beans become cheaper, than 20% of the consumers from the low strata will prefer the thin snap bean. Also in the middle and high strata consumers respond in this way, but to a less extent.

The results of the third photo are more difficult to interpret. The responses appear to be illogical. Probably this is caused by the sequence of the photos, by which the consumers get a little bit confused about the reason why the prices changes in such an illogical way. That's maybe why more consumers turn back on the stable ripe snap bean of $ 60.00. It's known that strong price fluctuations can be of big irritation for the consumers (FAO,1984).

The third type of response that can be recognized is for part of the high strata. The respondents from those strata show a positive sensitiveness for high prices. Probably they relate high prices with good quality.

Table 25 Preferences for degree of maturity versus prices (%-age of respondents), Bogotá, dec.'87-jan.'88.

	Thin	Ripe	Overripe
Preferences of consumers (N=120) prices are all $ 60:			
Low strata (1+2)	-	70	30
Middle strata (3+4)	-	90	10
High strata (5+6)	-	95	5
Preferences of consumers (N=120) price sequence is $ 50-60-70:			
Low strata (1+2)	20	65	15
Middle strata (3+4)	13	77	10
High strata (5+6)	9	76	15
Preferences of consumers (N=120) price sequence is $ 70-60-50:			
Low strata (1+2)	10	80	10
Middle strata (3+4)	7	87	6
High strata (5+6)	10	89	1
Preferences of restaurant owners (N=20):			
Price sequence $ 60-60-60	-	90	10
$ 50-60-70	13	76	11
$ 70-60-50	7	87	6
Preferences of mobile market traders and market stall holders (N=20):			
Price sequence $ 60-60-60	5	90	5
$ 50-60-70	5	85	10
$ 70-60-50	5	90	5

	Thin	Ripe	Overripe
Preferences of neighborhood shop owners (N=19):			
Price sequence $ 60-60-60	5	84	11
$ 50-60-70	5	90	5
$ 70-60-50	4	73	23
Prices according wholesale traders for quantity unit of 60 kg.: $	3.300	5.300	4.300

8   ATTITUDES TOWARDS SNAP BEANS

8.1 Attitude measurement through statements

Besides of the vegetable purchases, snap beans haven't been looked at in relation to other vegetables. As is shown in chapter 5.2, there are many substitutes for snap beans. To highlight the special features of snap beans in comparison with other vegetables, attitudes were measured through a method that is described by Janssen. People were given cards with the names of five products; snap beans, fresh peas, spinach, carrots and red beets. Then general statements were read out and the people were asked to name the products that, according to them, were in agreement with the statement. Each person was presented fifteen statements. A comparison between the products can now be made by the sum, or percentages of agreements (Janssen,1986). The statements deal with the most important features of vegetable consumption, like relative prices, nutritive value and quality.

A disadvantage of this method is that it doesn't allow to measure intensity, because the respondents only can give a positive or negative response. Furthermore, there is no weighing of the importance of the statements, so that it is impossible to estimate a final, overall attitude per consumer per crop. A big advantage, however, is the minimum of time needed to collect the data (Janssen,1986).

Table 26 shows the percentages of agreements. The response on a statement is assumed to be independent from the responses on other statements. Therefore the percentages of agreements per product per statement are expected to be normal distributed. The significant differences between the values then can be determined as follows:

$p_0 - p_1$ = significant with a probability "X" if,

$$p_0 - p_1 > t_n * \sqrt{\frac{n^2 * p_0(1 - p_0) + n^2 * p_1(1 - p_1)}{(n - 1) * n^2}}$$

where t_n = t-value of significance, with probability "X" and n degrees
               of freedom,

and p_0 and p_1 = ratios of agreements for the crops compared in the
               analyzed statements.

With 120 observation the minimum significant difference with 95% probability
would be 0,107. With 20 observations the significant difference would be
0,208.

        Snap beans, together with fresh peas and carrots, are said to form
an important part in the vegetable consumption (1). People think that the
prices of snap beans, together with carrots, spinach and red beets are
moderately low, while the prices of fresh peas are thought to be very high
(3). If, however, prices lower down, or if the budget is higher, people want
to buy more snap beans, fresh peas and carrots (5,13).

        The taste of snap beans and fresh peas is said to be excellent, while
the taste of red beets is much less appreciated (4). Snap beans, together
with carrots are also used for special occasions, but fresh peas are more
fit for this. Spinach and red beets are hardly used for special occasions
(6).

        The idea of vegetables is that they are healthy. This is particular
true for carrots and less true for red beets (12). The idea about vitamins
is more or less the same, that particular carrots contain a lot of vitamins
and that red beets are thought to contain much less vitamins (8). In the
same way people think that vegetables are good for the growth of children.
Of carrots children grow the best and of red beets children grow less (14).
It is striking that it is also thought that the children also like carrots
the most and red beets the less (9). Snap beans are in all these cases
thought to be around the average, together with fresh peas and spinach.

        Vegetables are not thought to be very heavy in digestion. Snap beans
and fresh peas are thought to fill more than spinach, carrots, or red beets
(7).

Table 26 Percentage of respondents[1] agreeing to attitude statements for
different products, Bogotá, dec.'87

	Snap beans	Fresh peas	Spinach	Carrots	Red beets
1. This product forms an important part in your vegetable consumption	82	81	77	88	63
2. The quality of this product is always good	76	81	66	82	57
3. This product is expensive	30	80	19	22	22
4. This product has an excellent taste	82	82	63	70	48
5. If this product would be cheaper you would buy more of it	87	80	67	80	61
6. You use this product a lot in special occasions	61	72	23	56	18
7. This product fills sufficient	42	43	29	29	23
8. This product has a lot of vitamins	70	67	70	92	56
9. The children like this product very much	59	65	50	71	37
10. You loose a lot of this product during the cleaning and preparation	25	18	8	9	14
11. The preparation of this product is a lot of work	29	29	1	5	19
12. This product is very healthy	81	74	82	87	66
13. If your household budget would be more, you would buy more of this product	71	68	62	71	55
14. The children grow good by eating this product	81	80	82	95	61
15. This product decay fast	54	34	60	22	14

1) Percentages corrected for population per stratum

Snap beans and spinach are thought to decay moderately fast. The other three products show less problems for its decay and it is the less for red beets (15). The quality, however, is thought to be the less stable for red beets and also for spinach.

The people have the idea that the quality of carrots, snap beans and fresh peas is good and stable (2). Those three vegetables are also the three that form the most important part in vegetable consumption.

During the cleaning and preparation, people do not experience big losses of the products. The losses are particular low for spinach and carrots, and the highest for snap beans (10). The preparation of snap beans also take more work than the other vegetables, although it still isn't very much (11).

For some statements there appears to be differences in percentages of agreements between the socioeconomic strata. The concerning statements are those with numbers 5,6,9,13 and 15 (table 27). If prices are lower, or if the budget is higher, than more of the people from the lower socioeconomic strata will buy more vegetables, than of the higher strata. Also in the lower strata, vegetables are more for special occasions than in the higher strata, with an exception for the lowest stratum. Remarkable is that in the lower strata more people think that the children like vegetables very much, than in the higher strata. Furthermore it appears that in the lower strata more people have the idea that they loose much of the vegetable products, when cleaning and preparing them, than in the higher strata. And also in the lower strata more people say that vegetables putrefy fast, than of the higher strata.

Table 27   Mean percentage of respondents agreeing to attitude statements for different strata, Bogotá, dec.'87.

	I	II	III	IV	V	VI
5. If this product would be cheaper you would buy more of it	90	80	78	73	70	54
6. You use this product a lot in special occasions	33	56	48	47	34	20
9. The children like this product very much	93	68	68	46	40	39
13. If your household budget would be more, you would buy more of this product	90	79	66	65	62	27
15. This product decay fast	52	41	42	34	25	34

8.2 Price conception in relation to other attitudes

In chapter 7 it was noted that prices could serve as a quality index. High prices signify good quality and low prices mean bad quality. With the information about the attitudes, it is possible to analyze the relation between the conception of the prices and attitudes to other product characteristics. Price conception can be recognized in the statements 3, 5 and 13. In table 28 correlations are shown between the price conception and the attitudes to some product characteristics. It is striking that particular taste perception (4,6,9) is highly correlated with the price conception. Also there is correlation between price conception and the idea that one looses a lot of the product during the cleaning and preparation. Attitudes to health aspects (8,12,14) on the other hand are hardly correlated with price conception.

Table 28 Price conception in relation to other attitudes; pearson
correlation coefficients (95%) dec.'87.

	This product is expensive	If this product would be cheaper, you would buy more of it	If your household budget would be more, you would buy more of this product
2. The quality of this product is always good	-	-	-
4. This product has an excellent taste	0,50	0,57	0,41
6. You use this product a lot in special occasions	0,52	0,69	0,53
9. The children like this product very much	0,37	0,81	0,76
10. You loose a lot of this product during the cleaning and preparation	0,58	0,54	0,46
8. This product has a lot vitamins	-	-	-
12. This product is very healthy	-	-	-
14. The children grow good by eating this product	-	0,42	0,40

8.3   Underlying patterns and its relation to consumption level

The percentages of agreements per crop per statement were treated in a
factor analysis, with the varimax procedure, to clarify the underlying
patterns of the answers. The first two statements (1 and 2) were left out of
the analysis, because they didn't have a direct relation to appreciation of
the specific product characteristics. The analysis produced four factors,
which were able to explain 79% of the communality of the original matrix
with statement scores. Table 29 shows the loadings of the original
statements on the four factors. The interpretation of the four factors is as
follows;
Factor 1: "being favorite", associated with statements 5,6,9 and 13;
Factor 2: "good for health", associated with statements 4,8,12 and 14;
Factor 3: "buying and preparation inconvenience", associated with statements
          3,10,11 and 15;
Factor 4: "heaviness", associated with statement 7.

How the five crops score on the factors is shown in table 30. Snap
beans appear to be around the average for being a favorite vegetable.
Carrots are the most favorite, while red beets are the less favorite. Snap
beans score good on being good for health. Carrots, however, are thought to
be better. Spinach and fresh peas are around the average, while red beets
score very low on being good for health. Snap beans and fresh peas score
high on the buying and preparation inconveniency. Less inconvenient are
spinach, red beets and particular carrots. Snap beans and fresh peas score
also high on the heaviness factor. Carrots and red beets are thought to be
less heavy and spinach scores very low on this factor.

Table 29 Underlying patterns in the attitude measurement; factor loadings
of the attitude statements.

	Factor 1	Factor 2	Factor 3	Factor 4
1. If this product would be cheaper, you would buy more of it	0,88	0,15	0,33	0,13
2. You use this product a lot in special occasions	0,59	0,04	0,47	0,40
3. The children like this product very much	0,84	0,30	0,14	-0,06
4. If your household budget would be more, you would buy more of this product	0,94	0,05	0,11	-0,04
5. This product has an excellent taste	0,31	0,67	0,53	0,23
6. This product has a lot of vitamins	0,01	0,92	-0,10	-0,08
7. This product is very healthy	0,03	0,96	-0,05	0,07
8. The children grow good by eating this product	0,40	0,86	-0,12	0,09
9. This product is expensive	0,30	-0,06	0,70	0,07
10. You loose a lot of this product during the cleaning and preparation	0,37	-0,10	0,78	-0,16
11. The preparation of this product is a lot of work	-0,09	-0,14	0,74	0,25
12. This product decay fast	0,18	0,25	0,47	-0,34
13. This product fill sufficient	0,07	0,13	0,09	0,91

Table 30   Mean factor scores of the five vegetable products.

	Factor 1	Factor 2	Factor 3	Factor 4
Snap beans	-0,08	0,30	1,03	0,47
Fresh peas	0,29	-0,15	0,99	0,46
Spinach	-0,22	0,09	-0,50	-1,05
Carrots	0,49	0,73	-0,91	0,29
Red beets	-0,49	-0,97	-0,60	-0,18

The four factors were brought in relation to the consumption levels of those five vegetables through a regression analysis. Only one factor proved to be of significant importance in influencing consumption levels (table 31). Heaviness of the vegetable has a positive effect on the consumption level per capita per week of the concerning vegetable.

Table 31   Regression   coefficients of the   attitude   factors on   consumption level (gr. per head per week), Bogotá, dec.'87.

	Parameter	T-value	Probability > T
Intercept	1192,2	9,960	0,00
Factor 1	121,3	0,997	0,33
Factor 2	20,0	0,164	0,87
Factor 3	187,3	1,539	0,14
Factor 4	325,1	2,671	0,01

9 EXPLANATION OF SNAP BEAN CONSUMPTION BY THE ATTITUDES AND THE SOCIOECONOMIC FACTORS

9.1 The model for explaining consumption

Consumption level is seen as a result of the living standard, family composition, urbanization and attitudes. The living standard encloses education level, household budget for food, other household expenditures (like transport, housing, id.), income, properties, public services and occupation(s) of the household members. But those variables are highly correlated with each other, which makes it impossible to put more than one variable in a regression model. Most often income is taken as the variable that determines most of one's living standard and that therefore explains most of one's consumption level. But, of course, this is a limitation of the explanation possibilities. The influence of the other variables cannot be taken into account, but also income isn't as straight forward as the living standard. For example, in a family with high incomes, but also high debts, food expenditures and consumption level of certain foods can be low. Or in the other way around, a pensioner, who hardly has an income, can have nice saving accounts which make it possible to spend a lot of money on food. In the case of this study, however, there was direct information available about the living standard of the households in certain areas. The information concerns an index, called "the quality of life in the area of Bogotá", which enclose the following variables; household incomes, occupation level, employment, housing, public services, and illiteracy[1]

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1) The score of each variable was determined by comparing them with the highest and lowest level, found in Bogotá. All those scores were put in an equation that produced the index. The index then is a percentage score, which is low, if the scores of all individual variables are low, and which is high, if all those individual scores are high. In Bogotá the variation is between 22% and 97%. On the base of this index, a stratification into six levels is made for all the areas in Bogotá. These can be called the socioeconomic strata. It is this stratification, that is used for this study.

(DAPD,1986). So, this index is preferred for explaining the consumption of snap beans. Although information was also obtained about education level, and household expenditures, it all appeared to be highly correlated with the "quality of life" index[1].

Of the household characteristics, there was information about the age of the housekeeper, mean age of the household members, number of people who participated in the meals, and the number of people younger than 15 years who participated in the meals. Only the total number of people, who participated in the meals wasn't correlated with the living standard index, and therefore appropriate for the regression analysis.

Urbanization was made operational through a variable that enclosed the number of years that the household was established in Bogotá. This variable wasn't correlated with the living standard, nor with the number of participants in the household meals.

There was information about the attitudes through the statements. Those statements can be transformed into dummies, to make them appropriate for the regression analysis. There are, however, 15 dummies, corresponding with the 15 statements, which is quite a lot to put them all in the explanation model. As is shown in the previous chapter, there are four underlying patterns (factors) in the attitudes. Although the factors cannot be used directly on the original observation level, they can be used indirectly to

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1) The index will be difficult to interpret in its influence on consumption. However, it isn't important for CIAT to know the exact influence of income, housing, education, id.. In stead of that, the strength of the effect of the living standard compared with the strength of effect of the attitudes about product characteristics is more interesting.

indicate which statements can be chosen for the regression model[1]. Of each
factor one statement was taken in a way that they didn't correlate with each
other, nor with the above mentioned variables. The following statements are
chosen:

1. You use this product a lot in special occasions;

2. This product is very healthy;

3. The preparation of this product is a lot of work;

4. This product fills sufficient.

9.2 The results of the analysis

It was expected that the influence of the attitudes on consumption of
snap beans could differ between the strata. Therefore regression
coefficients are computed at three levels of socioeconomic stratum;
low=stratum 1+2; middle=stratum 3+4; high=stratum 5+6. The results of the
analysis are shown in table 32. The model explains 63% of the variance and
the F-value = 13,2, which means that the overall value of the model is good.
However, when there is made a closer look into the model, than it can be
noted that for some variables, there is a high degree of unreliability,
particular for the attitude variables. For this reason each attitude
statement was taken apart in a regression analysis, together with the living
standard and the number of participants. The number of years in Bogotá is
left out, because it didn't have any effect at all.

It first can be noticed that the influence of the attitudes is
relatively of small importance compared with the living standard and the
number of meal participants. And second it is notable that the effects of
the attitudes on consumption of snap beans is the highest in the high strata
and the lowest in the middle strata. In chapter 3.1 it was hypothesized that
the effect of the attitudes would be the lowest in the low strata.

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1) The factors are constructed on an aggregated level, in which percentages
   of agreements were used. This was necessary, because factor analysis only
   can be done on interval variables. So factor scores of the individual
   households cannot be computed.

If the vegetable product is a favorite one than consumption of that product rise. This positive effect is the strongest in the low strata. Consumption of snap beans than rise with 168 gr. per head per week. In the middle strata the rise is about 88 gr. per head per week, and in the high strata the effect is small and the coefficient is unreliable. For this attitude also the number of meal participants must be taken into account. Each additional person lowers consumption with 14 gr. per head per week.

The importance of the heaviness of snap beans appears to be low. Striking is however that it has a positive effect in the low strata (+137 gr. per head per week) and a negative effect in the high strata (-83 gr. per head per week). There is no effect in the middle strata. Also there is no effect of the number of meal participants on the snap bean consumption, if it concerns the attitude about heaviness.

The importance of the buying and preparation inconvenience is low. It has hardly, or no effect in the middle and low strata. The inconvenience only effects consumption level in the high strata. Consumption of snap beans lowers then with 158 gr. per head per week. This happens without influence of the number of meal participants.

The attitude about the snap beans as being good for health is the most important of the four. Striking is that this attitude has a positive effect on consumption of snap beans in the low strata (+122 gr.) and a negative effect in the high strata (-182 gr.). These effects, however, must also be seen in the light of the number of participants. Each additional person means a drop of 23 gr. per head per week.

Table 32 Snap bean consumption level (in gr. per head per week) explained
          by socioeconomic variables and attitudes through regression
          analysis, Bogotá, dec.'87.

	Parameter (T-value)		
	Low	Middle	High
The model with all the variables:			
Living standard	9,0	-	-	-
	(5,5)			
Number of participants	-27,6	-	-	-
	(-2.2)			
Years in Bogotá	-0,4	-	-	-
	(-0,2)			
Being favorite (st.6)	-	93,9	59,0	72,9
		(1,0)	(0,6)	(0,8)
Heaviness (st.7)	-	85,1	-128,4	-228,5
		(0,9)	(-1,3)	(-1,7)
Buying and preparation inconvenience (st.11)	-	-106,6	-52,4	-139,4
		(-1,0)	(-0,5)	(-1,4)
Good for health (st.12)	-	-3,8	-36,5	-25,1
		(-0,0)	(-0,4)	(-0,3)
The models with separated attitudes variables:			
1 Living standard	5,3	-	-	-
	(6,0)			
Number of participants	-13,6	-	-	-
	(-1,3)			
Being favorite (st.6)	-	167,7	87,7	49,3
		(2,3)	(1,3)	(0,6)

F = 37,9 R² = 0,61

	Low	Middle	High
2 Living standard	5,6	-	-	-
	(6,5)			
Number of participants	-6,7	-	-	-
	(-0,7)			
Heaviness (st.7)	-	137,2	-4,9	-82,5
		(1,7)	(-0,1)	(-1,0)
F = 37,0 R² = 0,60				
3 Living standard	5,5	-	-	-
	(6,5)			
Number of participants	-2,9	-	-	-
	(-0,3)			
Buying and preparation inconvenience (st.11)	-	-3,4	-59,1	-158,3
		(-0,0)	(-0,6)	(-1,7)
F = 36,4 R² = 0,60				
4 Living standard	7,7	-	-	-
	(6,1)			
Number of participants	-22,7	-	-	-
	(-2,1)			
Good for health (st.12)	-	122,2	-70,2	-182,4
		(1,8)	(-0,8)	(-1,8)
F = 41,1 R² = 0,63				
The model without attitude variable:				
Living standard	5,0	-	-	-
	(6,6)			
Number of participants	-0,9	-	-	-
	(-0,1)			
F = 89,2 R² = 0,60				

10   SUMMARY AND CONCLUSIONS

10.1 The results in response to the hypotheses

The total consumption of vegetables is indeed lower in the lowest socioeconomic strata. Vegetable consumption, however, is not the highest in the highest strata, but in the middle strata. Probably people switch on other food products, for example meat, if the living standard rises even more. Results from a nation wide consumption study, however, indicates a continuous higher level of vegetable consumption with rising incomes (Duque, 1984). The types of vegetables that differ between the strata in the quantity in which they are consumed, are almost in accordance with what was expected. Lentils are the "heavy" vegetables that are consumed more in the lower strata and less in the higher strata. Of the so-called "watery" vegetables, spinach, lettuce, tomatoes and onions are consumed more in the higher strata and less in the lower strata. Carrots and fresh peas, however, are also consumed more in the higher strata, although they are more "heavy" than "watery". Snap bean consumption doesn't differ between the strata. In the lower socioeconomic strata, however, there is some more preference for the very ripe snap beans, than in the high strata. In the high socioeconomic strata there is only preference for the common ripe snap bean and no preference for the thin, nor for the very ripe snap beans.

As for prices, three times as many consumers in the low socioeconomic strata prefer low prices to good quality aspects, than consumers in the high socioeconomic strata. The same is true for new variety characteristics, that three times as many consumers in the low socioeconomic strata prefer the low prices of new varieties to the common, more expensive variety. Although consumers from the lower strata agree easier with lower quality (as long as the prices are lower), they do not show more problems with conservation time, nor losses. They buy, however, more frequently, than consumers from the high socioeconomic strata.

Consumption level of snap beans can be explained to a high degree by the living standard (that is income, education level, occupation, id.). To a

less degree attitudes effect consumption. However, it is not true that the degree of effect of the attitudes rise with socioeconomic stratum. Although the heaviness of the vegetable is of most importance in the consumption of vegetables in general, it is of less importance for snap beans. In the low strata people consume 137 gr. snap beans per head per week more, if they think that snap beans fill good. In the high strata, on the other hand, people consume 83 gr. less. The inconvenience of snap beans, for part of buying and preparing, is only of importance for the consumers in the high strata. People then eat 158 gr per week less. If the people look at the vegetable as favorite in consumption, than the consumption rise with 168 gr. in the low strata and 88 gr. in the middle strata. In the high strata this attitude doesn't matter. The attitude about snap beans, as being good for health, is the attitude of most importance in the explanation of the consumption level. In the low strata, however, people then consume 122 gr. per week more, while in the high strata they consume 182 gr. less.

In the four lowest strata, there are more than three times as less families per trader, than in the two highest strata. The traders, who operate in the lower strata, however, deal in small quantities. Principally they are neighborhood shop owners. In the highest strata, it are mainly supermarkets, who provide the vegetable demand. Supermarkets deal in big quantities.

Although this study didn't include a collection of consumer prices, it is generally said, that supermarkets are more expensive, than other types of outlets. This is in agreement with what is known about their market policy. As was expected, consumers from the low socioeconomic strata buy particular in neighborhood shops and market places, while consumers form the high strata buy to a great extent in supermarkets. The relation of purchased quantities in the traditional outlets with purchased quantities in supermarkets, in the lowest stratum up to the highest stratum, is respectively 9:1, 6:1, 4:1, 4:1, 2:1, 0,5:1.

In how far retail traders dare to manage low prices at the expense of good quality is difficult to say. All, except two, of the visited retail

traders (excluding restaurants) said to prefer to deal in snap beans of good quality. One retail trader said to prefer to deal in two different qualities with different prices and one said to prefer low quality for being able to sell at low prices. He was indeed one of the few retail traders, who had snap beans of really bad quality. Most of all retail traders had snap beans of tolerable, or good quality. So, it appears indeed that most retail traders don't like, and avoid, to trade in cheap snap beans of low quality. However, this couldn't be proved through the data from this study.

To examine the degree of free entry in vegetable/snap bean trade, data were collected about years of education, age, years in business, years on actual place and costs. It appears indeed that a lower degree of free entry is caused by the higher risks of specialization. Wholesale trade, retail trade in the mobile market system, or a business in the restaurant sector are the most difficult to start with. Retail trade on market places proves already to be easier and the easiest is to open a neighborhood shop. The margins, however, are more or less equal for all types of individual traders, that is around $ 13.oo per kilogram.

In the competition between consumption and within restaurants, restaurant owners are less exigent on the quality of snap beans, than housewives. Also the portions of snap beans are smaller. In the household consumption, portions in soup, dish and salad are respectively 60 gr., 91 gr. and 95 gr.. In restaurants, portions are respectively 7 gr., 38 gr. and 21 gr.. The number of preparations of snap beans in restaurants seems to be a little bit higher, than in the households. The result, however, is that 7,5% of all the meals, being taken out of the house, correspond with about 2% of the total snap bean consumption.

10.2 Implications for vegetable marketing and consumption research

In chapter 1, the typical characteristics of vegetables in marketing and consumption were highlighted. Some important conclusions can now be made for further vegetable research. First of all a thorough understanding of the typical characteristics of vegetables in marketing and consumption must be

obtained. In all cases, perishability and quality have to be important issues in vegetable research. They have particular impact on the marketing of the product, which is focused on a fast distribution. One problem that is caused by the perishability is the irregular supply (it cannot be stored for some time) and the corresponding price fluctuations. Interesting is therefore to examine the degree of vertical coordination for assuring a minimum and fast supply (Harris,1981; Gsanger, ?). The big supermarket chains are examples of vertical coordination. But also attention must be set on other types of vertical coordination. An example from this study are the few mobile market traders, who tried to pass sometimes the wholesale trader by making their own contacts with farmers, or farmer organizations. It is in the plan of the mobile market organizations to develop this buying policy into a more important way of vegetable acquisition.

As for consumption it must be clear why people consume vegetables. Most often vegetables serve in completing a meal. The appreciation is for taste, vitamins and minerals, the variation possibilities, id.. Constraints on consumption can be the high prices and the high price fluctuations. Price and income elasticities of snap bean demand were derived from the food consumption study of DANE-DRI, and are shown in table 33. It can be noticed that price elasticities are high, particular in the low socioeconomic strata.

Table 33 Urban price and income elasticities of snap bean demand (and their T-value) for five socioeconomic strata, Colombia, 1981.

	Very low	Low	Middle	High	Very high
Price elasticity	-1,37	-0,75	-0,51	-0,46	-0,38
	(4,6)	(7,2)	(2,5)	(4,0)	(2,1)
Income elasticity	-0,18	0,81	-0,16	0,87	-0,38
	(0,3)	(1,3)	(1,1)	(1,4)	(0,1)

Source: CIAT, a cross sectional analysis of the DANE DRI 1981 household survey

An important aspect which appears from above mentioned, is how the market channel reacts on the enormous fluctuations in demand caused by the high price elasticity and the high price fluctuations. If prices double within a week, what is very normal in the snap bean market, than there will be a big fall down in demand in the low income strata and a smaller fall down in the high strata. And in the other way around, if prices halve, there will be an enormous rise in snap bean demand in the low income strata and a smaller rise in the high income strata. How resolves the market channel those fluctuations? Theoretical it can be assumed that;

1. there are a lot of opportunists operating in the vegetable market in areas of low socioeconomic stratum;
2. there are a lot of traders, who sell to poor people, if prices are low, and who sell to rich people, if prices are high;
3. the traders in low strata manage very broad product ranges, in which they change their assortment according to the products with low prices;
4. the traders in low strata manage a narrow product range and have to deal with big fluctuations in their weekly, or monthly sales;
5. the poor people go to other outlets, when prices are low.

This study showed that neighborhood shops are of particular importance for the areas of low socioeconomic standard. During the study it was noticed that the type of vegetables, being in the shops, weren't always the same. Snap beans, although one of the main vegetables, weren't always available, because of high prices. In the case of high snap bean prices, shop owners buy in stead of snap beans for example fresh peas. So, it seems that in the case of Bogotá, the third type of interaction between marketing and consumption exists. The other four solutions don't seem very probable. Unfortunately, this issue wasn't fully realized before the study was executed. So, no information was collected about it.

Another important aspect for part of the price fluctuations is that the information is fully dependent on the time period of data collection. The month December differ completely from another month in the year. Furthermore, data collection has to be done,
a) in a short time, without negligible price fluctuations, or
b) over a longer time with measurement of wholesale, retail and consumer prices. Price measurement, however, has to be done very frequently, because prices can double, or triple, and then halve again within a week.

10.3 Implications for agricultural food policies

Food policies should be focused on price stabilization by developing a steadier supply. Because storage in cold stores and such like, will make the product more expensive, regulation of supply should be done in another way. The most appropriate way would be through regulation of the seed distribution by farmer organizations.

A second point of interest should be a better control of the quality. A grading and sorting mechanism is, however, not easy to start. Again entrance can be found in the seed distribution.

10.4 Implications for improvement of snap beans

By means of this study, several points of interest for snap bean improvement have been clarified. Because CIAT try to focus his work to the benefit of the marginal part of the population, the following points of interest are mentioned.

The improvement may not result in beans that are less "heavy", than the existing beans. It would even be better if the improvements focus itself on a snap bean that is thicker, fuller and larger, than the existing one. However, this mustn't go together with a high degree of seed development within the pod.

Low prices will favor particular consumers of the low socioeconomic strata. CIAT there fore should focus attention to the development of a snap bean that has lower costs in production and marketing. This can be reached by a variety that need less insecticides, pesticides, fertilizer and particular less work by hand[1]. In the marketing channel, costs can be reduced by a product that is less perishable.

During the improvement work, most attention for part of the quality should be paid on the color (emerald green) and the absence of dark spots and other symptoms of diseases. Form and length of the snap bean are less important. By improvement it should be avoided to end with a small, or a pale green snap bean. The best entrance for new product characteristics will be for a yellow, a dotted and a flat, broad snap bean.

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1) The present snap beans have to climb along cords. This signify that each plant has to be corded. The result is that man labor is the highest cost factor for farmers of snap beans (Dijken,1988).

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SUMMARY

Through this study an attempt is made to highlight the typical issues of vegetables in urban marketing and consumption. This is done by a theoretical comparison of vegetables with staple foods. Then the typical issues are transposed into hypotheses, which subsequently were investigated. An important issue is the perishability of vegetables, therefore the extremely fast distribution, without storage or delay, and therefore big supply fluctuations and big price fluctuations.

In the consumption study, consumption levels, quality criteria and quality defects, preferences and attitudes are measured, together with several socioeconomic factors. For part of the preference measurement a new and fast survey method is used by means of photos. The attitudes are measured through agreements on general statements for five different vegetable products. There appear to be four underlying patterns in the attitude statements:
1. "being favorite"
2. "good for health"
3. "buying and preparation inconvenience"
4. "heaviness"
This information became useful in the explanation of snap bean consumption level by socioeconomic factors and attitudes. Particular the attitude about being good for health proved to be of some importance.

In this study also institutional consumption is taken into account. Information is collected about how restaurants deal with snap beans in their meal preparations.

For part of urban marketing an attempt is made to clarify how distribution is done and next how marketing is connected to consumption. Or in other words, how traders look at quality and quality defects, and which market area they serve.

At last conclusions are drawn for part of the hypotheses, further vegetable research, agricultural food policies and improvement by CIAT.

ANNEX I   Buying and selling prices on the wholesale market, CORABASTOS.

Table 1   Mean buying prices ($/kg.) of snap beans from Fusagasuga on
          CORABASTOS, 1984-1987.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1984	28,1	39,7	32,3	23,5	28,8	46,1	37,9	43,4	38,6	41,0	35,9	52,2
1985	58,2	50,6	43,3	49,7	48,7	31,9	38,2	56,1	55,5	32,1	49,4	59,7
1986	53,0	62,2	77,6	45,3	36,1	48,9	70,0	60,3	74,5	88,0	62,7	43,1
1987	61,6	64,5	62,5	50,7	49,9	52,2	69,0	64,7	67,5	77,9	85,2	92,4

Table 2   Mean buying prices ($/kg.) of snap beans from the east on
          CORABASTOS, 1984-1987.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1984	25,8	37,6	29,3	21,8	27,1	46,2	33,1	41,9	38,0	39,4	34,5	53,7
1985	61,7	47,0	42,3	47,0	47,0	30,2	36,4	57,6	55,3	29,0	49,4	60,8
1986	52,5	63,8	78,7	44,3	32,7	46,3	68,5	59,3	73,0	101,6	60,7	40,1
1987	59,2	63,7	62,9	40,9	49,3	48,3	68,3	62,1	64,9	80,0	84,7	93,6

Mean buying price of snap beans from Fusagasuga in 1987: $ 67,6 per kg.
Mean selling price of snap beans from Fusagasuga in 1987: $ 79,8 per kg.
Mean margin for snap beans from Fusagasuga in 1987: $ 12,2 per kg.

Mean buying price of snap beans from the east in 1987: $ 66,9 per kg.
Mean selling price of snap beans from the east in 1987: $ 79,9 per kg.
Mean margin for snap beans from the east in 1987: $ 13,0 per kg.

Mean margin for snap beans (corrected for quantity per
origin) in 1987: $ 12,3 per kg.

Source: CECORA-Bogotá

ANNEX II Mean consumer prices ($/kg.) per month of two supermarket chains,
1987.

| | CARULLA | | SARJO-CAFAM |
	1986	1987	1987
Januar	114	128	138
Februar	130	115	138
March	164	152	154
April	159	134	122
May	107	119	119
June	86	129	120
July	109	127	124
August	142	127	126
September	122	130	158
October	162	157	156
November	197	172	210
December	126	221	154

Source: CARULLA and SARJO

ANNEX III Purchased quantities of vegetables per head per week (gr.),
Bogotá, dec.'87.

	Stratum					
	I	II	III	IV	V	VI
Cabbage	89	82	104	98	81	99
Red beet	133	106	188	187	88	127
Spinach	80	49	146	106	100	154
"Ahuyama"[1]	160	90	209	179	144	99
Potato	1023	1309	1817	1357	450	611
Spaghettis[2]	18	16	334	41	50	28
Cucumber	107	49	136	171	138	108
Lettuce	18	16	63	49	81	94
Carrot	285	278	533	398	263	325
Fresh pea	107	147	324	333	163	237
Dry pea	53	16	42	16	25	6
Fresh bean	71	82	261	138	38	121
Dry bean	18	49	42	41	69	11
"Haba verde"[3]	–	49	282	114	44	66
Snap bean	308	262	692	392	366	393
Tomato	329	155	773	309	325	468
Onion	276	147	585	341	288	402
Lentil	36	65	21	16	25	–
Cauliflower	9	82	–	–	6	–

1) "Ahuyama" is actually a fruit

2) Spaghettis aren't vegetables, but they are often used as alternatives for
vegetables (see chapter 5.4)

Source: Household consumption survey, Bogotá, dec.'87.

ANNEX IV Total purchased quantities of vegetables per week (kg.), Bogotá,
dec.'87.

Product	kg.	Product	kg.
Potato	5.367.636	Cucumber	531.842
		Spinach	449.029
Snap bean	1.916.040	Cabbage	366.056
Tomato	1.895.913		
Carrot	1.615.774	Lettuce	215.093
Onion	1.608.017	Dry bean	166.855
Fresh pea	1.101.674		
		Dry pea	105.958
"Ahuyama"[1]	675.061	Lentil	84.264
Fresh bean	657.736		
"Haba verde"[2]	649.051	Cauliflower	25.177
Red beet	632.861		
Spaghettis[3]	628.307		

1) "Ahuyama" is actually a fruit

2) "Haba verde" is a type of broad bean

3) Spaghettis aren't vegetables, but they are often used as alternatives for
vegetables (see chapter 5.4)

Source: Household consumption survey, Bogotá, dec.'87.

ANNEX V   Photos of the preference inquiry.

$60.00 $50.00

$60.00 $50.00

$60.00 $50.00

$60.00 $50.00