Preserved Bananas as a New Business Opportunity

by

David Andonie

B.S., Industrial Engineering
Florida International University
(1988)

Submitted to the Sloan School of Management
in Partial Fulfillment of
the Requirements of the Degree of
Master of Science in Management

at the

Massachusetts Inscitute of Technology
February 1991

Signature of Author_____
MIT Sloan School of Management
February 15,1990

Certified by_____
John D.C. Little
Institute Professor, Professor of Management Science
Thesis Supervisor

Accepted by_____
Jeffrey A. Barks
Associate Dean, Master's and Bachelor's Program

Preserved Bananas as a New Business Opportunity

by

David Andonie

Submitted to the Alfred P. Sloan School of Management
on January 25, 1991, in Partial Fulfillment of
the Requirements for the Degree of
Master of Science in Management

ABSTRACT

One of the most important decisions modern corporations face is that of new product development and introduction. This thesis is a practical example of marketing research for the introduction of preserved bananas in the form of banana chips and dehydrated bananas.

The markets for the two products are substantially different. Banana chips are a snack with broad appeal, but dehydrated bananas appeal only to well to do, health-conscious people. Based on the response and analysis of a consumer survey, included in this thesis, only banana chips were found to have the potential to be a successful product. Some key components of the marketing mix for banana chips are specified, such as price, target market, positioning, and possible improvement of key product characteristics.

Also included in this thesis is an analysis of the investment opportunity to launch banana chips as a new product. Throughout the analysis, the perspective taken is that of a small Honduran investor. The final recommendation is for the Honduran investor to look for an American joint venture partner with the marketing, distribution, and financial capabilities to launch banana chips nationally.

Thesis supervisor: John D.C. Little
Title: Institute Professor, Professor of Management Science

Table of contents

I. Introduction 5
Goals 5
Background 5

II. Product characteristics 6
Banana chips 6
Dried Bananas 8

III. Consumer evaluation of products 10
Description of survey 10
Questionnaire description 11
Survey distribution and response 12
Results of survey 13
Summary of results 13
Tally of responses 14
Crosstabulation: a market segmentation 17
Regression analysis 20

IV. Market characteristics 24
Sales potential of banana chips 24
Current market 24
Potential market size 25
Potential growth 26
Penetration 27
Competition 28

V. Investment Considerations 28
Scale 28
Input requirements 29
Investment required 29
Raw material availability 31
Technological advancement necessary 32
Risk 32
Stability 32
Probability of competitive retaliation 33
Rate of technological change 33
Organizational capabilities 34

Table of contents
(Continued)

VI. Financial analysis 35
National introduction 35
Assumptions 36
Net present value 37
Regional introduction 38
Assumptions 38
Net present value 39

VII. Conclusion 40

I. Introduction

One of the most important decisions modern corporations face is that of developing a new product or of entering a new market. Millions of dollars are spent in market research every year, but if more money were spent on market research, it would often be well spent money.

Goals

The primary goal of this thesis is to explore the market for preserved banana products, while the secondary objective is to apply market research and new product development tools within a practical framework. Naturally, the market research has been constrained by the limited resources available to a student. Nevertheless, the author intends to use these tools throughout his career within the framework of a small Honduran company which will also have severely limited resources.

Background

Every year, Honduras exports millions of bananas, mainly to the United States, at a premium price for each banana. But a significant portion of the Honduran banana crop does not meet export grade requirements due to size deficiencies or skin

defects. These bananas are cheap enough to be used as cowfeed by Honduran farmers; 20 metric tons cost less than US $100.

This source of cheap bananas represents a tremendous opportunity for a company able to produce and market a banana-based product. For a Honduran company, the challenge lies in finding a marketable banana product and a way to distribute the product in the United States.

II. Product characteristics

This thesis covers market research for two products: banana chips and dried bananas. Although, natural banana is the basic ingredient in both, the products are very different.

Banana chips

Banana chips are slices of bananas which are picked green before the starch turns to sugar, and deep fried in coconut oil, similar to potato chips. Although banana chips are deep fried, this is not obvious from their appearance. They are crispy, but not as crispy as potato chips. They are banana color (light yellow) and elliptical in shape, with the long diameter being

about 0.75" and the short diameter about 0.50". The slices are either thin (economy store quality which breaks in shipment) or thick (fancy store quality, about 1/16").

Most banana chips are sweetened and contain artificial banana flavor to make them more tasty. This is because they are made from green bananas which are not yet sweet and lack banana flavor. The chips used in this study were fancy, sweetened, and with banana flavor.

Banana chips are sold in bulk or packaged in 3, 8, or 16 ounce plastic bags. Although packages do not state shelf life, it is at least a couple of months. Table 1 below shows the nutritional information of a typical package of banana chips.

Table 1: Banana chip nutritional information

Serving size	1 Ounce
Calories	150
Protein	Less than 1 gram
Carbohydrates	18 grams
Fat	8 grams
Sodium	0 MG
Percentage of US recommended allowance (US RDA):	
Protein	Less than 2%
Vitamin A	Less than 2%
Vitamin C	4%
Thiamine (B-1)	4%
Riboflavin (B-2)	2%
Niacin	Less than 2%
Iron	2%

Dried bananas

Dried bananas are not readily available in the market, so the dried bananas used in the market research phase of this thesis were prepared by a small company in Honduras. The company has shown interest in dehydrated fruits because it has idle capacity in some of its dehydrating equipment.

The preparation process was as follows: slightly ripe bananas were sliced in round slices about 1/2" thick using tensed nylon cords as a cutting instrument (a metallic cutting instrument will turn the banana black after a short time). The bananas were then placed in trays in a cart which went into a dehydrating oven. They were dried for 12 hours at a temperature of approximately 350 degrees Fahrenheit. Finally, the bananas were allowed to cool down and were vacuum packed to help preserve them for the trip to Boston.

Two batches of dried bananas from Honduras were tested: the first batch was very dry and had been mistreated because of the vacuum packing. Most had a dark-brown color to them, with some of them showing a white color at the edges. The taste, however, was not affected. The second batch was less dry, had a light-

brown color, and was in general more homogeneous and in better condition than the first batch.

In addition, a batch of dried bananas from Ecuador was used. These bananas were dried whole, and were darker and moister than the ones from Honduras. Although the bananas were whole, they were sliced to about the same size as the Honduran slices for the purposes of consumer evaluations.

Dried bananas are sweeter than natural bananas, but not as sweet as banana chips, and the natural-banana flavor is much harder to identify. The bananas from Honduras were tough, while the ones from Ecuador had a softer, more chewable consistency.

No preservatives or artificial flavors were added to any of the dried bananas used in the market research, either to preserve the color or to extend the shelf life of the finished product. In contrast, most dried fruits in the market are treated with burning sulphur for a period of about 4 hours before drying, to preserve the color of the fruit. Potassium sorbate is another commonly used preservative to prevent mold in dried fruits with high moisture content, such as prunes.

III. Consumer evaluation of products

Initially, meetings with potential consumers were done to determine reaction to dried bananas. Subjects, which included a couple of marketing professors and several students at the Sloan School of Management, were informally introduced to the product and then were asked for their reaction to dried bananas. Most people did not like them initially, but several subjects liked them after they had a few of them.

After the first informal explorations of consumer reaction, a survey was prepared to measure a broad range of attributes about dried bananas and banana chips.

Description of survey

The survey was prepared as a kit containing:

a) Individual samples of banana chips, dried bananas, and raisins.

b) A seven-page questionnaire to measure consumer evaluation of a broad range of attributes of bananas, banana chips, dried bananas, and raisins.

c) A stamped, addressed envelope for participants to return the questionnaire.

In essence, the survey asks consumers to taste banana chips and dried bananas and rate them on attributes such as sweetness, smell, and moisture content. For comparison purposes, consumers are also asked to rate raisins and bananas on the same attributes.

Initially, 4 copies of the survey were distributed among Sloan students to pretest the survey. After the pretest, some unnecessary questions were eliminated and others were rephrased, and the size of the questionnaire was cut in half, to seven pages. Additionally, it became apparent that dried bananas were not a well accepted product, so the format of one of the questions was changed: instead of merely rating the content of each attribute in dried bananas, participants could suggest which attributes were too low or too high.

Questionnaire description

A copy of the questionnaire is attached in Appendix A. The questionnaire consists of eighteen questions:

Questions 1-3 are concerned with consumer's buying and spending patterns, and lifestyle attitudes.

Questions 4-6 measure awareness, advertising exposure, and perceived availability of banana chips, dried bananas, bananas, grapes, and raisins.

Questions 7 and 8 ask for the respondent's perception of the nutritional content of bananas and grapes, which are the basic ingredient of preserved banana products and raisins.

Question 9 asks the respondent to rate bananas on several attributes based on previous experience with fresh bananas.

Questions 10-12 asks the respondent to taste the enclosed samples of banana chips, dried bananas, and raisins, respectively, state whether they would buy them and at what price, and rate the products on the same attributes as question 9.

Questions 13 to 18 collect demographic information from the respondent.

Survey distribution and response

A total of 77 surveys were distributed among customers of a full-size supermarket in Somerville, Massachusetts. Customers exiting the supermarket were intercepted and asked to take the survey home and mail back the questionnaire in the enclosed envelope. Of those who accepted the survey and took it home, a

total of 25 responded, for a 32.5% response rate (a high response rate for a survey of this type).

Of the 77 surveys distributed, 25 contained dried bananas from the first Honduran batch, 25 contained dried bananas from Ecuador, and 27 contained dried bananas from the second Honduran batch. The response rate for each of these subgroups was 36%, 28%, and 26% respectively.

Results of survey

Summary of results

1) Dried bananas as prepared in this survey are not readily accepted by most people.
2) Possible improvements to dried bananas should be to increase moisture, improve appearance, and increase sweetness.
3) Dried bananas are a luxury product for the well to do and health conscious.
4) The potential market for banana chips is roughly 25% of the raisin market, or about $350 million.
5) Banana chips are perceived as a one dimensional product -- a snack. The product should be positioned as a snack.
6) Retail distribution of banana chips should be through convenience stores and health stores. The target market are

middle income, 25-30 year olds, college educated, who enjoy exercise and like fruit.

7) Fat content in banana chips should be minimized.
8) A strong banana smell should be maintained in banana chips.
9) Banana chips should not be extremely dry.

Tally of responses

As a first step in the analysis, the responses were tabulated by category of respondent: pretest respondents, respondents who sampled dried Honduran bananas from batch 1, respondents who sampled dried bananas from Ecuador, and finally, a total for all respondents. Exhibit 1 shows the summary of questionnaire responses. Percentage figures represent the percent of respondents in the given category who responded affirmatively to the given question, and all other figures represent averages.

Most of those who responded tend to shop at supermarkets (naturally), but about one half and one fourth also shop at convenience stores and health food stores, respectively. The average amount spent on food per week is $65. On the average, respondents say they are slightly health conscious and read labels, but are indifferent to branded products and to the prospect of exercising regularly. Respondents feel strongly

about liking fruits for their taste, although they are also slightly in agreement with liking food for health reasons.

Demographically, respondents' ages concentrated around 20-45 years old, with the average being 32 years. Most (62%) were college graduates, single (55%), male (55%), and earned more than $30,000 dollars (62%).

Awareness, advertising exposure, and availability are very high for bananas, raisins, and grapes, but much lower for banana chips, and lowest for dried bananas. The nutritional perception of bananas and grapes is very similar, with both fruits perceived as high in overall nutrition and vitamin content, and low in fat content.

The four products rated as follows on the "like" questions (9a, 10a, 11a, & 12a), on a scale of 15:

Bananas	12.78
Raisins	11.11
Banana Chips	8.73
Dried Bananas	4.86

On the buy question (10b, 11b, 12b), the three products rated as follows (respondents were not asked whether they would buy bananas):

Raisins	93%
Banana Chips	52%
Dried Bananas	21%

The main conclusion that can be drawn from this data is that dried bananas as prepared in this survey are not readily accepted by most people. Another conclusion is that there may be a market for banana chips, but it is not nearly as large as the market for raisins. If one allows for optimism on the part of some of the buyers who state they would buy banana chips, the potential market for banana chips may be roughly 25% or less of the raisin market.

Respondents assigned more uses to bananas and raisins, the higher rated products. This may be due to a higher familiarity with these products, but it may also be that banana chips are perceived as a one dimensional product -- a snack. 90% of respondents replied they would use banana chips as a snack, and no other use got a response higher than 24%.

It is possible to see what is wrong with dried bananas from averages of responses to its attributes, as participants were asked to indicate whether dried bananas contained too little (1), about right (4.5), or too much (8) of a given attribute. Dried bananas contain too little softness, sweetness, smell, and

moisture, and too much chewyness, toughness, and color. This conclusion is also supported by comments provided by respondents, such as "very chewy", or "Americans buy with their eyes".

To improve dried bananas, the following should be done:

- Increase the moisture by drying less, thereby increasing softness, and decreasing chewyness and toughness. With a higher moisture content, however, it may be necessary to add potassium sorbate as a preservative to prevent mold.
- The appearance of the product may be improved either by experimenting with different shapes (for example, cutting the bananas into small cubes the size of raisins, thus making a dark, raisin-like product) or by making a light-colored dried banana by using sulphur before drying.
- Finally, sweetness could be improved by experimenting with different ripeness levels or by adding a sweetener or an artificial flavor.

Crosstabulation: a market segmentation

It is possible to segment the market for dried banana chips by doing crosstabulations of those respondents who will buy the product. For example, 52% of the total number of respondents

said they would buy banana chips. Table 2 below shows the results of crosstabulations for those segments with greater than 52% response; they represent the target market for banana chips.

Table 2: Crosstabulations of potential banana chip purchasers

	Number of Respondents in Segment	Response Rate of Segment
Purchase at:		
Convenience Store	14	64%
Health Food Stores	7	57%
Spending per week		
$60 to $80	10	60%
more than $80	10	60%
Health Conscious		
Score 8-10 on scale of 12	10	60%
Score >10 on scale of 12	12	58%
Read Labels		
Score 8-10 on scale of 12	6	67%
Score >10 on scale of 12	11	64%
Prefer Ready to Eat Food		
Score <8 on scale of 12	8	63%
Score 8-10 on scale of 12	9	56%
Enjoy vigorous exercise		
Score 8-10 on scale of 12	7	57%
Score >10 on scale of 12	8	63%
Like fruit because of taste		
Score >11 on scale of 12	18	61%
Like fruit because of health		
Score >11 on scale of 12	14	64%
Age		
Age 25 - 30	13	69%
Education		
Completed college	18	56%
People in Household		
2 people	10	70%
Gender		
Male	16	56%
Income		
$30,000-39,999	9	67%

Table 2 suggests that distribution of banana chips should be oriented to convenience stores and health food stores more than supermarkets. Since the product is perceived as a snack, perhaps the major emphasis should be toward convenience stores.

The product should be targeted to middle and high middle income people, who spend at least $60 per week in foodstuff. Moreover, the typical consumer is 25-30 years old and has completed college. Thus, distribution should be targeted to regions with high concentration of these type of people.

Packaging, advertising, and promotion should depict natural bananas to increase appeal to people who like fruits. Moreover, ads should depict two people of the target group, possibly exercising together.

Although those who are health conscious and those who read labels seem to enjoy the product, the primary focus of the product should not be as a health-food product, but as a snack. Although banana chips contain complex carbohydrates, they are also fried and contain a high fat content. Consumer communication should emphasize the banana in the product.

Moreover, every effort should be made to diminish the fat content of the chip.

Crosstabulations on those consumers who would buy raisins are not shown because the results are uninteresting (almost all people say they will buy raisins), while crosstabulations on dried bananas are too sparse, being based on the response of one or two people, and thus may be misleading. In general, however, there is a difference between the potential segment for dried bananas and that for banana chips. Dried bananas seem to be a luxury product oriented for high grocery-spending people who are very concerned with health. For example, of those who spend $40-$80, 0% said they would buy dried bananas, but of those who spend more than $80, 40% said they would buy the product. Moreover, those who are concerned with health and who read labels tended to be stronger buyers of banana chips.

Regression analysis

Several regressions were run with "Like" as the dependent variable, using the responses to questions 9a, 10a, and 12a. The response for dried bananas was not used because many of the independent variables were not available for dried bananas,

since the format of attribute ratings was different for dried bananas.

First, the regressions were run by concatenating the variables for bananas, banana chips and raisins to increase the number of observations and obtain a higher statistical significance. The overall pool of 24 independent variables available was:

Awareness, advertising exposure, availability, overall nutrition perception, fat content perception, calorie content perception, vitamin content perception, sweetness, smell, roughness, moisture, softness, fiberness, chewyness, toughness, color, use product as ingredient, use product as meal, use product as side dish, use product as appetizer, use product as breakfast, use product in breakfast with cereal, use product as desert, and use product as snack.

After exploring the variables by the use of forward and backward stepwise regressions, the final regression included the following five variables, which were chosen for their meaningfulness and statistical significance:

	T-Values
Use product as a snack	4.24
Use product with cereal	4.04
Use product as a desert	3.50
Use product as a meal	-2.66
Awareness	2.17

The R-squared was 49.20, and the equation was:

Like = 0.076 + (5.7)*Snack + (2.91)*Cereal + (2.42)*Desert + (.48)*Awareness

where snack, cereal, and desert have the value 0 or 1, depending whether the person would use the product for that purpose, and awareness is in a scale of 1 to 8, with 8 being extremely aware.

Although the above equation is a good predictor internally, based on the given dataset, it does not shed much light on what makes a good product. Consumer's perceptions of bananas and raisins have a dominant influence, as both products may be seen as snacks, as good to eat with cereal, and as deserts. Moreover, it is not very useful to know that awareness is a key determinant of "liking". If one wants to sell any product, one must obviously make consumers aware of it.

A second approach was to use the same pool of 24 independent variables as above, but using only the observations for banana chips to obtain the best regression equation. The resulting equation included the following three variables, with their respective t-values:

Use banana chips as a snack	4.06
Moistness of banana chips	3.76
Smell of banana chips	2.13

The R-squared was 39.23, and the equation was:

Like = 2.828 + (6.1)*Snack + (0.67)*Moistness + (0.36)*Smell

where snack has the value 0 or 1, depending whether the person would use the product for that purpose, and moistness and smell are in a scale of 1 to 8, with 8 being extremely moist.

The regression confirms the earlier result about banana chips being seen mainly as a snack. Advertising, promotion, packaging, and distribution should emphasize the snack aspect of the product.

In the product development phase, every effort should be made to maintain a strong banana smell. Respondents seem to like the banana smell, as one of them commented: "The banana chips have a strong, pleasant banana smell". Banana smell can be improved by the use of artificial flavoring.

Although moisture is a significant variable, with a t-value of 3.76, and its coefficient is positive, its presence in the equation should be interpreted with care. In the 29 questionnaires received, there are only two cases in which respondents rated moisture higher than two (in a scale of 8):

one respondent rated moisture with a 3, and the other respondent was a 71 year old female who left many answers blank (it is possible she did not understand some of the questions). Both of these respondents were on the extreme end of the like question (10a), so may have been important in the regression results. Thus, the presence of the moisture variable does not imply that banana chips should be as moist as possible. It does imply, however, that they should not be extremely dry; a rating of 2 is preferable to a rating of 1 (on a scale of 8).

IV. Market characteristics

Sales potential of banana chips

Current market

By one estimate, the current market for banana chips is about 400 tons per month, or 4800 tons per year. Most of the chips sold in the US come from The Philippines and Thailand. No major FDA requirements for the importation of this food-product exist, except for cleanliness standards.

The retail price of banana chips varies, depending on the type of retail store and the type of packaging. In the low end they

sell for about $2.25 per lb. when they are sold unbranded at a low-margin health-food coop. In the high end they are $5.28 per lb. for branded chips at a regular health food store. Using the average of these two, $3.76 per lb., the current retail market for banana chips is about 40 million dollars.

In contrast, an estimate of the raisin market is 356,988 tons per year, based on the average annual production of California raisin growers. Raisins retail for about $1.80 to $2.00 per lb., so the market is about 1.4 to 1.5 billion dollars per year.

Potential market size

Given that awareness and availability for banana chips are relatively low, there is a great potential for growth in the banana chip market if awareness, advertising, and availability are increased substantially. In the survey, the average price respondents suggested for banana chips, $1.62 per lb., was very similar to the price for raisins, $1.75 per lb. Also, the survey suggests the market for banana chips could be about 25% of the market for raisins, given the same level of awareness and availability and the same price. This suggests the potential retail market for banana chips is about 350 million dollars.

Potential growth

Supermarket sales in the US are expected to grow 5% - 6% per year, with 2% - 3% growth accounted for by new products, 1% - 5% by inflation, and 1% by population growth. Thus, the food & beverage industry as a whole is in a stable, mature stage of the life cycle of industries. Nevertheless, one of the fastest growing segments within this industry is fruit-related products segment. Table 3 shows some examples of the market size and growth of fruit related new products:

Table 3, Market size and growth of some fruit related products

	Market Size	Market Growth
Fruit flavored soft drinks	$3.9 B	13%
Apple Juice	$1.9 B	10%
Fruit Blends	$0.3 B	20%

Using the above as a guideline, the banana chip market could grow at a rate between 10% to 20%, given adequate advertising and availability to raise the level of awareness. If a major advertising campaign were also done to introduce the product, the growth rate may exceed 30% or 40%. Even at a 40% growth rate, it would take more than six years for the product to grow from the current $40 million dollars per year to the potential $350 million dollars.

Penetration

In today's food & beverage industry, the advertising needed to create a new market runs in the order of millions of dollars. Large scale entry into the market will also require an investment in banana chip packaging facilities. Moreover, because the food industry is mature, competition for shelf space has become very intense, and it is not easy to gain access to distribution. For these reasons, it is not feasible for a small Honduran company to attempt to enter and dominate the US banana chip market.

There are two other options for a Honduran company to follow: one is a joint venture with an American partner with marketing experience, distribution capability, and the willingness to make a substantial investment in advertising; the other is to enter the US market as a minor player, but to try to dominate a region. An investment in advertising would still be required, but not as large as trying to enter the national market. In the first option, the American company would own the brand, as it would be making a major investment in advertising, but in the second, the Honduran company would own the brand.

Competition

The time to enter the banana chip market is now, as there are no large established competitors. Some large companies have banana chip products, for example Hershey Import Co.'s "Love Snacks" division puts out "Honey Roasted Banana Chips", but none has established itself as a dominant player in the market, and most banana chips are still sold in bulk. The market for banana chips is in its infancy stage.

V. Investment considerations

Scale

The advantage of a large scale entry into the market will be the potential to achieve a significant market share, and to create a brand which will become a barrier to entry for other competitors. There are also economies of scale in distribution, and in easier access to shelf space with a heavily advertised brand.

There are no major economies of scale in production, as the technology for frying and packaging banana chips is relatively

well known and inexpensive. There may be economies of scale in running a large banana plantation, but in a country like Honduras, where there are many large banana plantations, there is a competitive market for bananas, so there are no real advantages to owning and running a banana plantation.

Since it will take at least two to three years for anyone to become an established player in the banana chip market, it is possible for a competitor to enter the market during that time. The risk of a competitor entering the market is higher if a regional roll-out of the product is done, or if the Honduran company enters only a regional market on its own.

Input requirements

Investment required

Two alternatives to market banana chips have been considered. One is the introduction of banana chips into the US market at a national level, presumably done by a joint venture between a Honduran company and a US company. Under this alternative, the investment would be larger and would include a packaging plant, the advertising budget would be larger, and the total market would be larger.

The other alternative is the introduction of banana chips into the US market at a regional level by a Honduran company. This alternative calls for less advertising, less investment, repackaging the product by a US contractor, and limiting the distribution and availability of banana chips to only a region of the US, so the market would be smaller.

If a joint venture with a large American company is made, the investment necessary for a national roll-out may be as follows:

Table 4, Investment for large scale entry

Banana chip packaging plant	
Processing equipment	100,000
Packaging equipment	200,000
	300,000
Pretest Market	
Advertising, promotion, distribution	400,000
Total Investment	700,000

If a large-scale introduction is done, the quantity of bananas required may be so large that the supply of cheap, defective bananas in Honduras may be exhausted, and it may be necessary to also purchase export-grade bananas at a much higher marginal cost, driving up the average cost of bananas. Moreover, a national introduction would require an advertising budget of about $1 million per year.

If it is not possible to do a joint venture, the Honduran company could attempt a regional introduction at a lower cost, but the project would be more risky because of the threat of entry by a national competitor. To cut down the required investment, a smaller processing plant can be built, and the product can be initially packaged by a US repackager. The required investment for a smaller processing facility would be about $60,000.

Raw material availability

Raw material availability will not be a major problem if the processing plant is locating in a major banana producing country, such as Honduras, Ecuador, or Costa Rica. In Honduras, for example, there is an ample supply of non export-grade bananas which would be enough to supply a regional roll-out of banana chips. For a national roll-out, however, it may be necessary to purchase some export-grade bananas, driving up the average cost of the raw materials. There is an ample supply of export-grade bananas, however, and they can be easily purchased at market prices.

Technological advancement necessary

The technological advancement necessary is minimal, as the technology used to fry banana chips is very similar to the one used for potato chips. The only difference is that banana chips are first fried, then dipped in a mixture of sugar and water, and then fried again at a controlled temperature to make the sugar coating brittle. In The Philippines, this process is done with very rudimentary equipment.

Risk

Stability

Stability is an important consideration whenever an investment is made in a country such as Honduras, Ecuador or Costa Rica, as Latin American countries have a reputation of instability. Nevertheless, in recent years, most Latin American countries have made serious progress to stabilize the area. For the first time in history, nearly all Latin American countries have democratically elected governments. Moreover, with "perestroika" and the collapse of the Soviet empire, the threat of impending revolutions has been removed, at least for the time being.

There remains a source of instability in the area which is harder to eliminate: economic instability and underdevelopment. Nevertheless, most Latin governments now understand that the only way to get out of the economic mess they are in is to provide incentives to increase exports, and to liberalize and open their economies to the world. Already, most Latin countries have taken major steps to improve their competitiveness and to liberalize their economies. As economic reform becomes more established, the aura of instability in the area will be removed.

Probability of competitive retaliation

As no large company has yet established a dominant position in the banana chip market, the probability of competitive retaliation is not very high. As was already pointed out, if a small scale regional roll-out is done, it is possible that competitors will try to enter the market, and in that case there may be competitive retaliation.

Rate of technological change

The rate of technological change in the food industry is not as fast as in other industries. There have been important changes, such as the introduction of the freeze dried process and the

extrusion process for snacks, or the wide availability of microwave which has changed demand patterns. But these changes have not suddenly and unexpectedly turned the industry upside down. They are trends which take years to develop. Thus, technological obsolescence is not a major source of risk for banana chips.

Organizational capabilities

A Honduran company will be severely constrained by its organizational capabilities and by its financial capabilities from launching the product into the US market nationally. For example, a Honduran company would not have the marketing capabilities, the access to a distribution system, the ability to service the product (or the clients of the product), or the management skills and experience required to launch the product into the US market. Thus, it would be a major gamble for a Honduran company to launch the product on its own into the US market.

The Honduran company might still attempt a small scale launch at a regional level, but it would be a gamble because of the lack of experience and weak organizational capabilities. Thus, the preferred alternative would be for the Honduran company to

find an experienced American joint venture partner with the organizational and financial capabilities to execute a national product launch.

VI. Financial analysis

Financial analysis was performed under two scenarios: national introduction by a joint venture of American and Honduran companies and a regional introduction by a Honduran company alone. In summary, the national introduction has a much larger net present value than the regional introduction, but it also requires a larger investment. The regional introduction, on the other side, has less of a potential reward, but requires a smaller investment. However, the regional introduction may be riskier because of possible entry of national competitors, and the lack of marketing experience in most Honduran companies.

National introduction

Exhibit 2 shows a financial analysis for a national introduction of banana chips. Included in the analysis are proforma income statements for years 1-5 and annual proforma income statement

after year 5, proforma cashflow from operations for the same years, and calculation of net present value.

Assumptions

The analysis assumes a retail price of $2.00, and retailer and wholesaler markups of 33% and 20% respectively. Since this would be a large scale product introduction, there would not be any more intermediaries. The contribution margin is $0.84 per pound for the first year, after all variable costs.

After the first year, the contribution margin decreases gradually as the average cost per ton of bananas increases from $100 in year 1 to $500 in year 5. Average banana cost increases because the price of non-export grade bananas may increase slightly as demand by the processing plant increases. Also, if the supply of non export-grade bananas is exhausted, it will be necessary to purchase a small percentage of export-grade bananas at a cost in the range of $700 to $1000 per pound, which will drive up the average cost of bananas. Given the large supply of non export-grade bananas in countries like Honduras or Costa Rica, an average cost of $500 for year 5 is a conservative estimate.

The greatest fixed cost component would be the 1 million dollars for advertising each year. The project assumes an initial national market of 5,000 tons, growing at 15% per year for 5 years, and then remaining steady. The joint venture would achieve a market share of 15% the first year, and 25% all other years, resulting in yearly sales ranging from 750 tons (approximately 38 truckloads) to 2,514 tons (126 truckloads).

Net present value

Net present values were calculated under discount rates ranging from 10% to 26%. It is not clear what the correct discount rate for this project should be. Although the opportunity cost of similar food-product projects in the US may be in the 10% to 12% range (reflecting a fairly low beta), the location of the project in Honduras introduces complications. For example, for an American investor, there may be political risk in investing in Honduras, which would *raise* the opportunity cost of capital. But, for the same investor, direct investment in Honduras provides a means to diversify which is not available in the US financial markets, and with increased diversification comes a *lower* cost of capital. For a Honduran investor, on the other hand, this project has a very high Beta, because the Honduran economy is tightly linked with the yearly banana crop, so the

opportunity cost for that investor would be much *higher* than for an American investor.

Thus, the net present value of the project was calculated under a variety of discount rates, considering the possibility of political risk, international diversification, and investors of different nationalities. Under all cases, the project shows a positive NPV, ranging from 2.6 million to 9.7 million, and requiring an investment of $700,000.

Regional introduction

Exhibit 3 shows a financial analysis for a regional introduction of banana chips by a Honduran firm. Included in the analysis are proforma income statements for years 1-5 and annual proforma income statement after year 5, proforma cashflow from operations for the same years, and calculation of net present value.

Assumptions

The analysis assumes a retail price of $2.00, and retailer, wholesaler, and importer markups of 33%, 20%, and 15% respectively. Since this would be a regional product introduction, there would be an extra intermediary in the form of the importer or broker. In addition, the investment does not

call for installing a packaging plant, so packaging would be done by a specialized repackager, at a cost of $5000 per 20-ton truckload ($0.11 per pound), plus the cost of packaging materials. Thus, the contribution margin would be $0.64 per pound, after all variable costs. The greatest fixed cost component would be the 200,000 dollars for advertising each year.

The project assumes an initial regional market of 1,000 tons, growing at 15% per year for 5 years, and then remaining steady. The joint venture would achieve a market share of 20% the first year, climbing to 30% in years 2 and 3, but gradually declining to 15% after year 5, as national competitors enter the regional market. This is a conservative estimate, assuming the worst case scenario of a large consumer products company such as Hershey entering the market aggressively. Yearly sales estimates range from 200 tons (approximately 10 truckloads) in year 1, to 397 tons (20 truckloads) in year 4.

Net present value

Net present value is also calculated using a range of discount rates from 10% to 26%, for the same reasons outlined above. The net present value of the project for the regional introduction

is in the range of $146,000 to $277,000, depending on the discount rate used. It is lower than the net present value for the national project, but the investment is also lower at $60,000.

VII. Conclusion

A good investment opportunity exists for a corporation willing to enter the banana chip market. The potential size of the market, about $350 million, is enough to sustain the advertising and administrative overhead to launch a major introduction of the product.

The market research carried out as part of this thesis suggests the best way to enter the banana chip market. In general, the product should be oriented to single 25-30 year olds, middle to upper middle income, college educated, who enjoy exercising and love fruit. An important channel of distribution should be through convenience stores, and the product should be clearly positioned as a snack with fruit content in it. Moreover, banana chips should be priced at about $2.00 per pound.

Since a Honduran company may not have the financial or organizational capabilities to finance a project of this sort, it may be tempted to attempt a small scale or regional introduction. However, a regional introduction still entails the risk of failure due to inadequate organizational capabilities, in addition to a greater risk of entry by a stronger national competitor.

Thus, the recommended course of action for a Honduran company willing to enter the banana chip market is to find an American joint venture partner with the financial and organizational capabilities to carry out a national banana-chip introduction.

Exhibit 1
Summary of Questionnaire Responses

Percentage figures represent the percent of respondents in the given category who responded affirmatively to the given question, and all other figures represent averages.

	Sloan Pretest	Honduran Bananas Batch 1	Ecuador Dried Bananas	Honduran Bananas Batch 2	TOTAL SAMPLE
Number of Respondents	4	10	7	8	29
1) Purchasing Patterns					
Supermarket	100%	100%	86%	100%	97%
Health food	50%	30%	14%	13%	24%
Convenience	75%	50%	29%	50%	48%
Other	0%	10%	0%	13%	7%
2) Spend per week	62.50	63.50	54.29	77.81	65.09
3) Lifestyle Agree/Disagree					
(12 = strongly agree)					
Health conscious	8.33	10.30	9.00	8.31	9.17
Branded products	3.83	7.89	6.57	5.63	6.33
Read labels	6.78	9.05	9.33	8.50	8.63
Prefer ready to eat	6.03	2.65	4.86	5.13	4.33
Prefer packaged food	3.35	5.20	8.50	6.00	5.96
Enjoy exercise	7.83	8.75	8.64	4.94	7.54
Like fruit for taste	10.83	10.80	10.93	11.06	10.91
Like fruit for health	8.33	9.45	10.79	10.13	9.80
4) Awareness					
(8 = extremely aware)					
Banana Chips	5.56	6.50	5.14	4.88	5.59
Dried Bananas	2.75	4.00	3.86	4.00	3.79
Bananas	7.81	7.90	7.71	7.38	7.70
Grapes	7.81	7.70	7.71	6.88	7.49
Raisins	7.81	7.60	7.43	8.00	7.70

Exhibit 1

(Continued)

	Pretest	Honduran Bananas Batch 1	Ecuador Dried Bananas	Honduran Bananas Batch 2	TOTAL SAMPLE
5) Advertisement Exposure					
(8 = have seen a great amount)					
Banana Chips	1.00	1.00	1.86	1.00	1.21
Dried Bananas	1.00	1.10	1.00	1.00	1.04
Bananas	5.56	6.10	5.57	5.75	5.80
Grapes	5.81	4.60	4.43	4.29	4.65
Raisins	7.56	6.90	5.57	6.63	6.59
6) Availability					
(8 = very available)					
Banana Chips	2.06	5.44	4.71	3.88	4.33
Dried Bananas	1.00	2.44	3.43	3.50	2.79
Bananas	7.88	7.80	7.86	8.00	7.88
Grapes	7.94	7.30	7.71	8.00	7.68
Raisins	7.94	7.90	7.57	7.88	7.82
Nutrition Perception					
7) Banana Nutrition					
(8 = very high)					
Overall Nutrition	7.00	7.40	7.57	6.00	7.07
Fat Content	4.25	2.60	2.14	3.33	2.89
Calorie content	4.13	4.00	3.71	4.67	4.09
Vitamin content	7.06	7.20	6.00	6.50	6.71
8) Grape Nutrition					
(8 = very high)					
Overall Nutrition	5.56	6.80	5.86	5.83	6.16
Fat Content	3.19	2.40	1.14	2.17	2.14
Calorie content	3.69	4.60	2.71	4.33	3.92
Vitamin content	4.06	5.80	5.43	6.00	5.49

Exhibit 1

(Continued)

	Pretest	Honduran Bananas Batch 1	Ecuador Dried Bananas	Honduran Bananas Batch 2	TOTAL SAMPLE
9) Evaluation of bananas					
(scale of 8 unless stated otherwise)					
Like (scale of 15)	12.88	12.20	12.71	13.50	12.78
Sweet (scale of 15)	5.50	11.25	10.36	6.43	9.00
Smell	5.25	6.00	4.71	4.50	5.14
Roughness	1.50	2.00	2.71	1.14	1.89
Moisture	4.75	5.67	4.57	4.63	4.96
Softness	7.25	6.80	7.00	6.50	6.83
Fiberness	4.50	4.20	4.86	5.57	4.75
Chewyness	3.50	3.80	2.71	3.38	3.38
Toughness	1.00	2.70	2.00	1.33	1.96
Color	5.50	6.40	5.71	5.88	5.97
Use Bananas as:					
Ingredient	75%	80%	29%	75%	66%
Main Meal	0%	10%	0%	0%	3%
Side Dish	0%	30%	0%	13%	14%
Appetizer	0%	20%	14%	25%	17%
Breakfast	50%	90%	43%	75%	69%
Cereal	75%	90%	57%	75%	76%
Desert	0%	60%	57%	88%	59%
Snack	100%	90%	100%	100%	97%
Other:	0%	20%	0%	25%	14%

Exhibit 1

(Continued)

	Pretest	Honduran Bananas Batch 1	Ecuador Dried Bananas	Honduran Bananas Batch 2	TOTAL SAMPLE
10) Evaluation of Banana Chips					
(Scale of 8 unless stated otherwise)					
Like (Scale of 15)	10.75	8.28	8.93	8.06	8.73
Buy	100%	50%	57%	25%	52%
Not Buy	0%	40%	43%	75%	45%
Price/lb (No scale)	2.75	1.75	0.94	1.23	1.62
Sweet (Scale of 15)	9.50	11.28	10.79	9.13	10.29
Smell	4.25	4.75	3.00	3.00	3.70
Roughness	4.75	6.22	4.43	6.29	5.56
Moisture	2.25	1.89	1.43	1.88	1.82
Softness	1.75	1.89	1.86	1.63	1.79
Fiberness	4.33	3.56	4.00	4.75	4.11
Chewyness	4.75	2.63	4.29	4.88	4.04
Toughness	4.00	5.33	3.86	6.14	4.96
Color	4.25	5.00	5.14	4.57	4.81
Use Banana Chips as:					
Ingredient	25%	10%	14%	0%	10%
Main Meal	0%	0%	0%	0%	0%
Side Dish	25%	20%	0%	25%	17%
Appetizer	25%	30%	14%	25%	24%
Breakfast	25%	10%	14%	13%	14%
Cereal	25%	20%	0%	25%	17%
Desert	0%	0%	29%	13%	10%
Snack	100%	70%	100%	100%	90%
Other:	25%	0%	14%	0%	7%

Exhibit 1

(Continued)

	Pretest	Honduran Bananas Batch 1	Ecuador Dried Bananas	Honduran Bananas Batch 2	TOTAL SAMPLE
11) Evaluation of dried bananas					
(For dried bananas, respondents were asked to indicate whether the given attributes were too high (1), too low (1) or about right (4 to 5). Unless otherwise indicated, scales are of this type.)					
Like (Scale of 15)	3.50	5.56	2.93	6.44	4.86
Buy	0%	20%	14%	38%	21%
Not Buy	100%	70%	86%	63%	76%
Price/lb (No scale)	1.00	1.42	1.10	1.29	1.26
Sweetness	5.25	3.86	3.71	3.00	3.77
Bitterness	2.25	5.25	5.29	4.17	4.52
Sourness	2.50	4.13	5.43	4.50	4.32
Smell	3.25	3.88	4.29	3.57	3.81
Roughness	4.00	5.38	4.29	3.75	4.41
Moisture	4.25	3.13	4.86	3.43	3.85
Softness	3.75	3.00	3.43	3.14	3.27
Fiberness	4.50	4.38	5.43	4.50	4.70
Chewyness	7.25	6.38	5.86	6.25	6.33
Toughness	5.75	6.13	5.33	5.63	5.73
Color	2.75	6.13	7.29	5.57	5.77

Exhibit 1

(Continued)

	Pretest	Honduran Bananas Batch 1	Ecuador Dried Bananas	Honduran Bananas Batch 2	TOTAL SAMPLE
12) Evaluation of raisins					
(Scale of 8 unless stated otherwise)					
Like (Scale of 15)	10.13	12.06	9.14	12.25	11.11
Buy	100%	90%	86%	100%	93%
Not Buy	0%	0%	14%	0%	3%
Price/lb (No scale)	2.50	1.85	1.50	1.33	1.75
Sweet (Scale of 15)	12.00	12.75	10.00	9.00	10.81
Smell	4.25	4.33	3.14	2.71	3.59
Roughness	2.75	4.33	3.71	2.17	3.42
Moisture	6.50	6.11	4.57	5.25	5.54
Softness	5.00	6.00	5.14	5.75	5.57
Fiberness	3.00	5.25	5.29	5.13	4.89
Chewyness	6.00	6.11	6.14	6.00	6.07
Toughness	2.75	3.44	3.29	2.67	3.12
Color	4.50	6.78	6.29	5.57	6.00
Use raisins as:					
Ingredient	50%	90%	57%	75%	72%
Main Meal	0%	0%	29%	0%	7%
Side Dish	0%	30%	14%	0%	14%
Appetizer	0%	30%	29%	25%	24%
Breakfast	0%	40%	43%	38%	34%
Cereal	25%	80%	57%	50%	59%
Desert	25%	20%	29%	50%	31%
Snack	75%	90%	86%	100%	90%
Other:	0%	0%	0%	13%	3%

Exhibit 1

(Continued)

	Pretest	Honduran Bananas Batch 1	Ecuador Dried Bananas	Honduran Bananas Batch 2	TOTAL SAMPLE
Demographic					
13) Age	26.75	29.89	29.33	39.38	32.11
14) Education					
6th Grade	0%	0%	0%	0%	0%
High School	0%	0%	43%	38%	21%
College	100%	70%	29%	63%	62%
Graduate	0%	20%	14%	0%	10%
15) People in Household	1.75	2.78	3.00	2.13	2.48
16) Marital Status					
Single	50%	50%	71%	50%	55%
Married	50%	30%	0%	38%	28%
"Div, Wid, Sep."	0%	10%	0%	13%	7%
Other	0%	0%	14%	0%	3%
17) Sex					
Male	100%	50%	71%	25%	55%
Female	0%	40%	14%	75%	38%
18) Income					
Less than 10K	25%	0%	0%	25%	10%
10K - 20K	0%	0%	14%	13%	7%
20K - 30K	0%	20%	14%	0%	10%
30K - 40K	50%	40%	29%	13%	31%
more than 40K	25%	30%	29%	38%	31%

Exhibit 2
Financial Analysis
for National Market Strategy

Key Assumptions of Financial Analysis for Regional Market Strategy

Retail markup =	33%
Wholesale markup =	20%
Retail Price =	$2.00
Wholesale Price =	$1.50
Price to Joint Venture company	$1.25
Price of Plastic Bags	$0.03
Natural banana yield	60%
Initial national market size	5000
National market growth	15%

	Year 1	Year 2	Year 3
Average cost of bananas (ton) =	$100	$200	$300
National Banana Chip Market	5,000	5,750	6,613
Market share of national market	15%	25%	25%
Sales (tons) =	750	1,438	1,653

	Year 4	Year 5	After 5
Average cost of bananas (ton) =	$400	$500	$500
National Banana Chip Market	7,604	8,745	10,057
Market share of national market	25%	25%	25%
Sales (tons) =	1,901	2,186	2,514

Exhibit 2

(Continued)

Proforma Income Statement,
Years 1-3

	Year 1	Year 2	Year 3
Revenues	$2,071,992	$3,971,319	$4,567,017
Variable Costs			
Bananas	125,000	479,167	826,563
Labor	67,500	129,375	148,781
3-oz. plastic bags	264,552	507,058	583,117
Cardboard Boxes	75,000	143,750	165,313
Shipping costs	150,000	287,500	330,625
Total Variable Costs	682,052	1,546,850	2,054,398
Contribution margin	1,389,940	2,424,469	2,512,619
Fixed Costs			
Administration	240,000	240,000	240,000
Advrt,Promo,Distr.	1,000,000	1,000,000	1,000,000
Deprec. & Ammort.	140,000	140,000	140,000
Total fixed costs	1,380,000	1,380,000	1,380,000
Pretax profit	9,940	1,044,469	1,132,619
Taxes (30%)	2,982	313,341	339,786
Net Income	**$6,958**	**$731,128**	**$792,833**

Exhibit 2

(Continued)

Proforma Income Statement,
Years 4-and after

	Year 4	Year 5	After 5
Revenues	$5,252,069	$6,039,880	$6,945,862
Variable Costs			
Bananas	1,267,396	1,821,882	2,095,164
Labor	171,098	196,763	226,278
3-oz. plastic bags	670,584	771,172	886,848
Cardboard Boxes	190,109	218,626	251,420
Shipping costs	380,219	437,252	502,839
Total Variable Costs	2679407	3,445,694	3,962,548
Contribution margin	2,572,663	2,594,186	2,983,314
Fixed Costs			
Administration	240,000	240,000	240,000
Advrt,Promo,Distr.	1,000,000	1,000,000	1,000,000
Deprec. & Ammort.	140,000	140,000	0
Total fixed costs	1,380,000	1,380,000	1,240,000
Pretax profit	1,192,663	1,214,186	1,743,314
Taxes (30%)	357,799	364,256	522,994
Net Income	**$834,864**	**$849,930**	**$1,220,320**

Exhibit 2

(Continued)

Cash flow from operations, Yrs 1-3 & Yrs 4-after

	Year 1	Year 2	Year 3
Net Income	6,958	731,128	792,833
Depreciation	140,000	140,000	140,000
CFOP	**$146,958**	**$871,128**	**$932,833**

	Year 4	Year 5	After 5
Net Income	834,864	849,930	1,220,320
Depreciation	140,000	140,000	0
CFOP	**$974,864**	**$989,930**	**$1,220,320**

Net Present Value Calculations
(Thousands)

	Discount Rate				
	10%	14%	18%	22%	26%
PV CFOP yrs 1-5	2,835	2,520	2,253	2,026	1,830
Terminal Value	7,577	4,527	2,963	2,052	1,478
minus Investment	-700	-700	-700	-700	-700
NPV	**$9,712**	**$6,347**	**$4,516**	**$3,378**	**$2,608**

Exhibit 3
Financial Analysis
for Regional Market Strategy

Key Assumptions of Financial Analysis for Regional Market Strategy

Retail markup =	33%
Wholesale markup =	20%
Importer/Broker markup =	15%
Retail Price =	$2.00
Wholesale Price =	$1.50
Importer/broker price =	$1.25
Price to Honduran company	$1.09
Price of Plastic Bags	$0.03
Ton of Banana chips/ton of banana	60%
Initial national market size	5,000
Regional market as % of national	20%
Regional market growth	15%

	Year 1	Year 2	Year 3
Average cost of bananas (ton) =	$5	$10	$20
Regional Banana chip market (tons)	1,000	1,150	1,323
Market share of regional market	20%	30%	30%
Sales (tons) =	200	345	397

	Year 4	Year 5	After 5
Average cost of bananas (ton) =	$80	$150	$200
Regional Banana chip market (tons)	1,521	1,749	2,011
Market share of regional market	25%	20%	15%
Sales (tons) =	380	350	302

Exhibit 3
(Continued)

Proforma Income Statement, Years 1-3

	Year 1	Year 2	Year 3
Revenues	$480,462	$828,797	$953,117
Variable Costs			
Bananas	1,667	5,750	13,225
Labor	18,000	31,050	35,708
3-oz. plastic bags	70,547	121,694	139,948
Cardboard Boxes	20,000	34,500	39,675
Packaging Charge	50,000	86,250	99,188
Shipping costs	40,000	69,000	79,350
Total Variable Costs	200,214	348,244	407,093
Contribution margin	280,248	480,553	546,024
Fixed Costs			
Administration	120,000	120,000	120,000
Advert., promo. & dist.	200,000	200,000	200,000
Depreciation	12,000	12,000	12,000
Total fixed costs	332,000	332,000	332,000
Pretax profit	-51,752	148,553	214,024
Taxes (30%)	-15,526	44,566	64,207
Net Income	**($36,226)**	**$103,987**	**$149,816**

Exhibit 3

(Continued)

Proforma Income Statement,
Years 4-and after

	Year 4	Year 5	After 5
Revenues	$913,403	$840,331	$724,786
Variable Costs			
Bananas	50,696	87,450	100,568
Labor	34,220	31,482	27,153
3-oz. plastic bags	134,117	123,387	106,422
Cardboard Boxes	38,022	34,980	30,170
Packaging Charge	95,055	87,450	75,426
Shipping costs	76,044	69,960	60,341
Total Variable Costs	428,153	434,711	400,080
Contribution margin	485,251	405,620	324,706
Fixed Costs			
Administration	120,000	120,000	120,000
Advert. promo. & dist.	200,000	200,000	200,000
Depreciation	12,000	12,000	0
Total fixed costs	332,000	332,000	320,000
Pretax profit	153,251	73,620	4,706
Taxes (30%)	45,975	22,086	1,412
Net Income	**$107,275**	**$51,534**	**$3,294**

Exhibit 3

(Continued)

Cash flow from operations, Yrs 1-3 & Yrs 4-after

	Year 1	Year 2	Year 3
Net Income	-36226	103987	149816
Depreciation	12000	12000	12000
CFOP	**($24,226)**	**$115,987**	**$161,816**

	Year 4	Year 5	After 5
Net Income	107275	51534	3294
Depreciation	12000	12000	0
CFOP	**$119,275**	**$63,534**	**$3,294**

Net Present Value Calculations

	Discount Rate				
	10%	14%	18%	22%	26%
PV CFOP yrs 1-5	316,325	280,837	250,548	224,532	202,052
Terminal Value	20,453	12,220	7,999	5,540	3,989
minus Investment	-60,000	-60,000	-60,000	-60,000	-60,000
NPV	**276,778**	**233,057**	**198,547**	**170,072**	**146,042**

Appendix A

Copy of Survey for Consumer Measurement of Preserved Bananas

Instructions: Please answer this part of the survey first, before opening or tasting any of the products enclosed.

1) Please mark all those establishments below at which you regularly buy food:

Large supermarket chain
Health food store
Convenience store
Other

2) How much does your family spend per week in groceries? ____

3) How strongly do you agree or disagree with the following statements?

	Strongly Agree	Strongly Disagree
I am very health conscious when I buy food.		
Branded products are generally better quality than unbranded products.		
I read food product labels when they are available.		
I would rather buy food that is ready to eat than food that must be prepared.		
I would rather buy packaged food than bulk food.		
I enjoy vigorous exercise.		
I like fruits because of their taste.		
I like fruits because they are a healthy food.		

4) In the scales below, please indicate your level of awareness of the existence of the following products:

	Not Aware at all							Extremely Aware
Banana Chips	1	2	3	4	5	6	7	8
Dried Bananas	1	2	3	4	5	6	7	8
Bananas	1	2	3	4	5	6	7	8
Grapes	1	2	3	4	5	6	7	8
Raisins	1	2	3	4	5	6	7	8

5) In the scale below, please indicate whether you have seen printed, radio or TV advertisements for the following products:

	Not Seen Any at all						Have Seen a great amount	
Banana Chips	1	2	3	4	5	6	7	8
Dried Bananas	1	2	3	4	5	6	7	8
Bananas	1	2	3	4	5	6	7	8
Grapes	1	2	3	4	5	6	7	8
Raisins	1	2	3	4	5	6	7	8

6) In the scale below, please indicate the availability of the products below:

	Not Available at all							Very Available
Banana Chips	1	2	3	4	5	6	7	8
Dried Bananas	1	2	3	4	5	6	7	8
Bananas	1	2	3	4	5	6	7	8
Grapes	1	2	3	4	5	6	7	8
Raisins	1	2	3	4	5	6	7	8

7) In the scale below, please mark the place that best represents the nutritional value of bananas:

	Very Low							Very High
Overall Nutrition	1	2	3	4	5	6	7	8
Fat Content	1	2	3	4	5	6	7	8
Calorie content	1	2	3	4	5	6	7	8
Vitamin Content	1	2	3	4	5	6	7	8

8) In the scale below, please mark the place that best represents the nutritional value of grapes:

	Very Low							Very High
Overall Nutrition	1	2	3	4	5	6	7	8
Fat Content	1	2	3	4	5	6	7	8
Calorie content	1	2	3	4	5	6	7	8
Vitamin Content	1	2	3	4	5	6	7	8

Instructions: Please answer the following questions based on your previous experience with fresh bananas.

9a) In the scale below, please mark the spot that best represents how much you like bananas:

Extremely like ├┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┤ Extremely dislike

9b) In the scale below, please mark the spot that best represents how sweet bananas are:

Extremely Sweet ├┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┤ Not sweet at all

9c) Please indicate the content of the following attributes in bananas:

	Very low							Very high
smell	1	2	3	4	5	6	7	8
roughness	1	2	3	4	5	6	7	8
moisture	1	2	3	4	5	6	7	8
softness	1	2	3	4	5	6	7	8
fiberness	1	2	3	4	5	6	7	8
chewyness	1	2	3	4	5	6	7	8
toughness	1	2	3	4	5	6	7	8
color	1	2	3	4	5	6	7	8

9d) In the list below, please indicate those situations you are likely to use fresh bananas.

As ingredient (eg. in a fruit salad)
Main meal
Side dish
Appetizer
Breakfast (stand-alone)
In breakfast with cereal
As a desert
As a snack
Other _____

9e) Do you have any other comments about bananas?

_____

_____

Instructions: At this time, please open the plastic bag labeled "banana chips" and taste the product enclosed. Then answer the following questions about these banana chips.

10a) In the scale below, please mark the spot that best represents how much you like the banana chips:

Extremely like |---|---|---|---|---|---|---|---|---|---|---|---|---|---|---| Extremely dislike

10b) If they were available in a store you normally shop at an acceptable price, would you buy the banana chips?

Yes
No

10c) What is the maximum acceptable price for 1 lb. of this product? _____

10d) In the scale below, please mark the spot that best represents how sweet banana chips are:

Extremely Sweet |---|---|---|---|---|---|---|---|---|---|---|---|---|---|---| Not sweet at all

10e) Please indicate the content of the following attributes in banana chips:

	Very low							Very high
smell	1	2	3	4	5	6	7	8
roughness	1	2	3	4	5	6	7	8
moisture	1	2	3	4	5	6	7	8
softness	1	2	3	4	5	6	7	8
fiberness	1	2	3	4	5	6	7	8
chewyness	1	2	3	4	5	6	7	8
toughness	1	2	3	4	5	6	7	8
color	1	2	3	4	5	6	7	8

10f) In the list below, please indicate situations you are likely to use banana chips:

As ingredient (eg. in a fruit salad)
Main meal
Side dish
Appetizer
Breakfast (stand-alone)
In breakfast with cereal
As a desert
As a snack
Other _____

10g) Do you have any other comments about banana chips?

_____

_____

Instructions: At this time, please open the plastic bag labeled "dried bananas" and taste the product enclosed. Then answer the following questions about these dried bananas.

11a) In the scale below, please mark the spot that best represents how much you like the dried bananas:

Extremely like |---|---|---|---|---|---|---|---|---|---|---|---|---|---| Extremely dislike

11b) If they were available in a store you normally shop at an acceptable price, would you the buy dried bananas?
Yes
No

11c) What is the maximum acceptable price for 1 lb. of this product? _____

11d) Please indicate whether the following taste attributes of dried bananas are too high or too low:

	Too Low			About Right				Too High
Sweetness	1	2	3	4	5	6	7	8
Bitterness	1	2	3	4	5	6	7	8
Sourness	1	2	3	4	5	6	7	8

11e) Please indicate whether the following attributes of dried bananas are too high or too low:

	Too Low			About Right				Too High
smell	1	2	3	4	5	6	7	8
roughness	1	2	3	4	5	6	7	8
moisture	1	2	3	4	5	6	7	8
softness	1	2	3	4	5	6	7	8
fiberness	1	2	3	4	5	6	7	8
chewyness	1	2	3	4	5	6	7	8
toughness	1	2	3	4	5	6	7	8

	Too Light			About Right				Too Dark
Color	1	2	3	4	5	6	7	8

11f) Do you have any other comments about dried bananas?

_____

_____.

Instructions: At this time, please open the plastic bag labeled "raisins" and taste the product enclosed. Then answer the following questions about raisins.

12a) In the scale below, please mark the spot that best represents how much you like raisins:

Extremely like |---|---|---|---|---|---|---|---|---|---|---|---|---|---|---| Extremely dislike

12b) If they were available in a store you normally shop at an acceptable price, would you buy raisins?

Yes

No

12c) What is the maximum acceptable price for 1 lb. of this product? _____

12d) In the scale below, please mark the spot that best represents how sweet raisins are:

Extremely Sweet |---|---|---|---|---|---|---|---|---|---|---|---|---|---|---| Not sweet at all

12e) Please indicate the content of the following attributes in raisins:

	Very low							Very high
smell	1	2	3	4	5	6	7	8
roughness	1	2	3	4	5	6	7	8
moisture	1	2	3	4	5	6	7	8
softness	1	2	3	4	5	6	7	8
fiberness	1	2	3	4	5	6	7	8
chewyness	1	2	3	4	5	6	7	8
toughness	1	2	3	4	5	6	7	8
color	1	2	3	4	5	6	7	8

12f) In the list below, please indicate all situations you are likely to use raisins:

As ingredient (eg. in a fruit salad)
Main meal
Side dish
Appetizer
Breakfast (stand-alone)
In breakfast with cereal
As a desert
As a snack
Other _____

12g) Do you have any other comments about raisins?

_____

_____

Instructions: Please answer the following demographic information about yourself.

13) How old are you? _____

14) What is the highest level of education you have completed?

6th grade	high school	College	Graduate School

15) How many people live in your household? _____

16) What is your marital status?

Single	Married	Divorced, widowed Separated	Other

17) What is your sex?

Male	Female

18) What is your total annual household income?

Under $10,000	$10,000 - $19,999	$20,000 - $29,999	$30,000 - $40,000	Over $40,000