

### **FRUIT IN SCHOOL VENDING MACHINES: A REALITY OR AN IMPOSSIBLE IDEAL?**

Automatic vending machines of fruit were installed in two Bergerac (24) high schools between February and May 2003. Despite four major advantages, the teenagers are relatively critical about the present vending machines. In addition, this alternative offering was favorably received. The fruit vending machines aroused interest and were popular. The quality of tastiness and variety of commercialized fruit available proved a tremendous success. The difficulty in offering feasible prices due to particularities in the target market and the importance of maintaining fixed costs, represent disadvantages that are too great to stand up to commercial companies. However, is the experiment too limited to come to a decision about its future already?



## **Reality or an impossible ideal?**

**T**he Health Ministry wishes to encourage the consumption of fresh fruit and vegetables by young people. It has asked APRIFEL to identify the types of intervention and methods of action likely to make buying patterns evolve in the sense of the National Health Nutrition Program's (NHNP) objectives. Two Bergerac high schools acted as a base experiment in this project. The test explored the

possibility of selling fresh fruit and some vegetables via vending machine to teenagers. The CTIFL was responsible for researching the technical aspects – which will be the subject of an upcoming publication – as well as determination of the expectations of this young, captive target market. This has been voluntarily left within a competitive context. No communicative action has taken place yet.

## The present vending machines:

### four great assets in a controversial area

The strengths of the regular vending machines are:

- complete ease of use “you put your money, press the button and it falls”;
- complete availability, operating outside of the constraints of the canteen or purchases external to the establishment (not necessarily well stocked) and access without an intermediary, being judged or criticism of the product;
- an offering that is 100 % practical enabling easy, rapid consumption, – although “an apple takes a while to eat” – the items are transportable, divisible and can vary
- a highly marketed offering: the products have a great reputation. Although indispensable, the vending machines are strongly criticized. Thus their link with their young customers is only a marketing one. The reliability of the equipment, however, which is, incidentally, unattractive and impersonal, is called into question. The available choice is unanimously qualified as expensive, incomplete (no salted products at Maine de Biran, no mineral water at Jean Capelle), rigid and “nutritionally inadequate” (items are too calorific while not being nourishing enough). The prices, ranging between 0.30 and 1.50 , are justified, according to the two groups, by the presence of leading brands (Twix, Mars, Kinder Bueno, Coca-Cola, Orangina). Having a monopoly at present, these snack products satisfy the requirements of a captive and hungry target market.

## Yes to an alternative offering

Teenagers reserved an overall favorable reception for the fruit vending

## METHODOLOGY

**B**efore the installation of the fruit vending machines in high schools two meetings, each one lasting from four to ten minutes, between mixed groups of ten students, were organized, the first on 13 January 2003 at the professional high school Jean Capelle (350 students) and the second on 21 January at the general Maine de Biran (1,500 students) high school. In parallel, a survey was carried out to complete a condition of the places of consumption of mainly fruit by the students. Half way through the experiment, a second questionnaire was run jointly with two new groups, carried out on 28 and 29 April to bring together the first impressions of the high school students after the vending machines were put in place. The experiment could resume at the start of the new school year. Elsewhere, the purchase statements started on 24 February were stopped on 30 May, beyond week 23, as social movements constituted an excessively large bias. There were no price studies. Those retained correspond to the price per kilo paid to the wholesaler for the given peri-

od/number of items of fruit contained in a kilo (see the table opposite). Bergerac was chosen due to its proximity with the centre of CTIFL of Lanxade. Responsibility for the study, and particularly the technical feasibility, was entrusted to Mr. Pierre Vaysse (vaysse@CTIFL.fr).

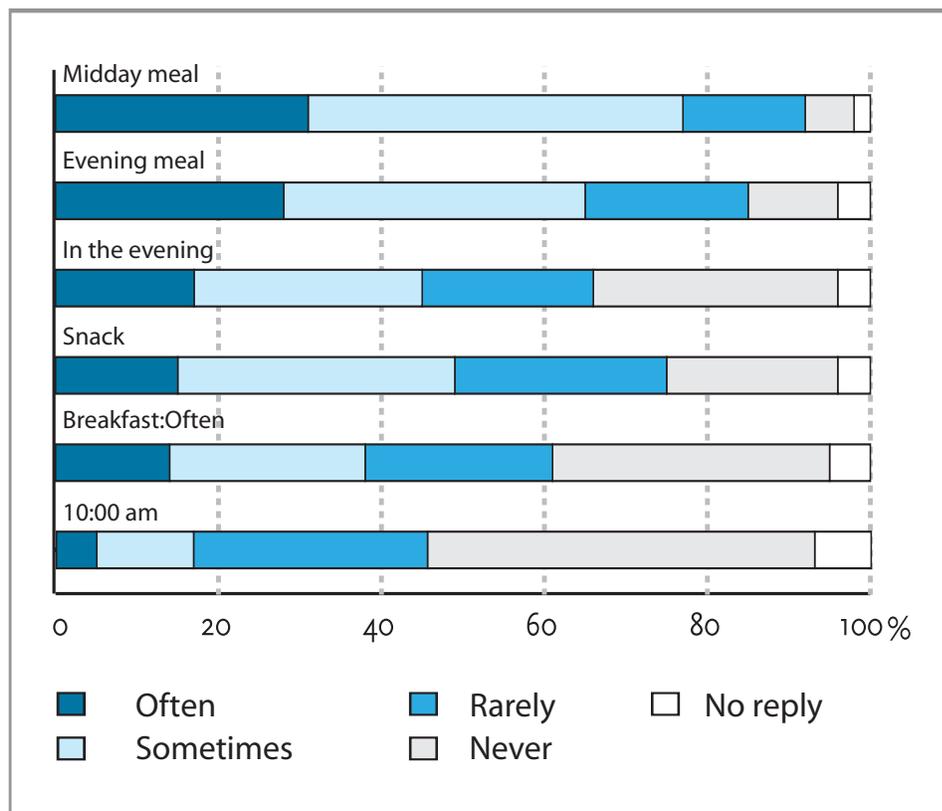
Product	nb fruits/kg
Golden	5.5
Fuji	5.5
Granny	5.5
Belchard®	5.5
Pink Lady®	5.5
Abbe Fetel	4.4
Orange	4.2
Clementine	10
Kiwi	13
Kumquat	70
Banana	7.5
Freyssinette	23
Cherry tomato i25g	125g

machines. The fruit and vegetables seem to be an attractive diversification. This would also seem to be true for other food products positioned in the same health/freshness territory. High school students say they are prepared to try this original offering at least once, out of interest. Faced with competition that is attractive and already strongly embedded in the market, this new offering has to be convincing in order to be popular. The impact of word of mouth in this closed world will do the rest. Among the disadvantages of the fresh fruit offer observed by these young consumers, we note uncertainty about tastiness and the impracticality of “generic” or, worse, unknown products, are culturally ill-associated to the business sphere. On the other hand, for the young people, variety is one of the successful elements of these vending

machines. The assortment offered would necessitate going beyond the regular fruits known as “canteen fruits”: apples, bananas and oranges. What’s more, to be qualitative, students would like to see a wide range that is regularly updated. Ideas abound: fruits available according to the seasons, around a theme such as colors (red berry fruits, citrus fruits), exotic fruits, vitamin C specials in winter, carotene specials or thirst-quenching fruit available before the holidays and potassium specials during exam periods. The objective is for these consumers to have a better knowledge about fruit, and even some vegetables (a range of tomatoes, and baby carrots) could be offered, for example; varying reputation, reintroduction of seasonal products, teaching about their tastiness and nutritional qualities and discovery of new prod-

ucts, is therefore feasible. At this stage in the study, there was genuine concern about the freshness of the products and numerous questions about the frequency and regularity of restocking, which must be visible, regular and often. The young people asked that all of the fruit for immediate consumption be washed in advance and the most fragile fruit packaged. For the students, if pre-packaging is synonymous with protection, it makes transportation easier and guarantees hygiene, as well as increasing costs: "packaging pollutes". The price of each item of fruit compulsorily aligned with those practices through competition will in no case exceed 1. Product life, restocking constraints...for these young consumers, no argument today justifies charging trade prices. The world of fruit seems out of touch with a business approach – is this all the more the case when the test, even the marketing, is carried out in rural areas?.

FIGURE 1-At what time of day do you eat fresh fruit? Basis: 440 question



## Consumption of fruit:

### Important progress

At Jean Capelle, 200 questionnaires were completed. At Maine de Biran, out of the 800 distributed during breaks, 240 were returned. During the week, in general, three quarters of teenagers eat in the high school canteen at midday and at home in the evening. Just under a quarter of them have dinner in the canteen. At weekends, the vast majority (90 %) eat at home. While more than two teenagers in three consume snacks on Saturdays and Sundays, less than half (44 %) do so during the week. Among these food purchases, a large number of the public consumes fresh fruit - 72 % say they are in the habit of eating it regularly – and do so before meals (SEE FIGURE 1).

A third of high school students "often" consume fresh fruits with their midday meal. Nearly one in two does

so "from time to time", either in the canteen for those on half-board or at home for the non boarders. A proportion of the less regular consumers of fruit lose nine points in the evening. Outside of mealtimes, the results are deceptive: we count between 50 and 80 % of weak points and non-consumers. Figures for snacks and in the evening are quite close. Nevertheless, the fruit break at four o'clock records slightly better performances: 20 % of absolute non-consumers compared with 30 % for fruit in the evening. Finally, nearly one high school student in two "never" eats fruit at ten am. The margins of progress are therefore large, in terms of recruitment as well as customer loyalty. Moreover, three quarters of teenagers don't say they are prepared to eat more fruit. The morning seems to be a difficult time slot for eating fruit without infantilizing these teenagers, who are looking to assert themselves through more adult

consumption such as black coffee. Besides, the afternoon seems to them to be a suitable time to eat fresh fruit outside of mealtimes (68 %) and availability of fresh fruit at school encourages them to do so (63 %), even with the midday meal (60 %). Outside of mealtimes, 35 to 40 % of teenagers say they consume fizzy drinks, candy, cookies, chocolate bars and ice-cream "from time to time". At the same time, around a third "often" consumes non fizzy drinks (39 %) and fresh fruit (33 %). Present vending machine purchases – which entail half of the respondents – are more liquids than solids. Of the recognized benefits of fresh fruit, the majority of high school students (90 %) say that they "don't make you fat", three quarters say that "they always taste good"... but at the same time, over half (59 %) would eat more fruit "if it tasted better" For over two thirds, fruit is convenient to eat and a little less than two thirds think that "it's

a real dessert”, a result which clearly show their anchorage in traditional food purchases.

## Interest and popularity.

High school students were sensitive to the vending machine’s appearance. They thought the presentation of the fruit was appropriate and practical. They can easily see the choice, more particularly inside the machine which looks clear and clean. Narrower than the regular vending machines, the equipment implies slimness and few calories. The blue color is not associated with the world of food or of fruit. It does however evoke freshness “like a big refrigerator”. On the other hand, they think it is not decorated enough. The teenagers understood how to operate it very well: turn the trays, open the barrier. The fruit vending machines were placed next to the regular machines in a traffic area, which is shown to be suitable. The students have not nicknamed the new item of equipment, which remains, prosaically, the “fruit vending machine”. As with the other machines, there was no approval. The labels are barely read or not at all, out of lack of time or interest. However, the young people in the two groups carried out in April prefer

“serious” information on nutritional values, for example, to more “entertaining” information. The students looked at the fruit, assessed it, and then bought it without feeling the need to refer to the label. The shortest names of the varieties were best remembered. Only the prices were known and (relatively) attributed to each fruit. The high school pupils read the label from the wholesaler giving the price in kilos (imposed by the DGCCRF), which was still the ultimate decisive criterion for them. Some of them even carried out comparisons with the prices in trade. The definitive choice is made in front of the machine depending on the available fruit. Purchases were also quite long compared to those done in other vending machines. With the latter, the teenagers know by heart the number corresponding to their preferred candy (52 for Kinder Bueno). The “fruit” reflex is still to be created. They estimate that there is less of a queue in front of the other vending machines since the installation of the fruit vending machine and that boys bought much less fruit than girls. According to the groups, their “global” weekly vending machine budget has still not evolved. If the fruit vending machine took some customers from the regular vending machines, then the price made the difference. With the same

amount of money, young consumers can buy more fruit than sweets. With regards to the assortment, the apple supply was considered too great (four trays out of ten during the test period); 4th range products (small fruit salads) even dried fruit, would be welcome. Putting two small apples of different varieties rather than one large fruit could encourage them to taste other varieties, to get to know them, recognize them, share purchases and vary their consumption. All these offers were tempting and still at only 1 maximum! The supply has satisfied them “it’s regular, clean and done properly”. Overall, their opinion was favorable and the final word positive: “it should continue”.

## Customer loyalty

Out of the 234 students who returned the second questionnaire, we counted three buyers in four, 73 %, had already responded to the first questionnaire. The quality of tastiness and variety of fruit available were unanimously acknowledged (94 % and 81 % respectively in favor). Devolution in terms of supply was perceived by 67 % of buyers, far from being true for the prices (test increase with the addition of a napkin, variation in the price increase

**TABLE 1**-Number of items of fruit sold during the twelve weeks in the two high schools

Amount Q sold Products	Days					Total	%
	Monday	Tuesday	Wednesday	Thursday	Friday		
Dried apricots	25	16	9	18	23	91	2,0
Bananas	45	27	33	33	40	178	3,9
Cherries	4	2	8		0	14	0,3
Clementines	50	30	26	42	33	181	4,0
Clementines + kumquat	9	7	8	2	4	30	0,7
Strawberries	108	125	106	88	133	560	12,3
Kiwis	20	22	5	18	21	86	1,9
Oranges	11	10	6	8	10	45	1,0
Pears	101	114	55	69	77	416	9,2
Apples	565	595	358	494	569	2581	56,9
Prunes	20	12	13	3	26	74	1,6
Prunes/Apricots	12	15	18	6	6	57	1,3
Grapes	11	10	7	6	11	45	1,0
Tomatoes	47	34	28	39	30	178	3,9
<b>Total</b>	<b>1028</b>	<b>1019</b>	<b>680</b>	<b>826</b>	<b>983</b>	<b>4536</b>	<b>100</b>
%	22,7	22,5	15,0	18,2	21,7	100	

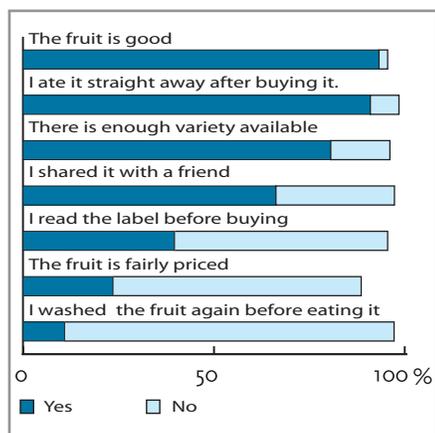
**TABLE 2**-Turnover accumulated during the twelve weeks in the two high schools

Turnover amount Products	Days					Total	%
	Monday	Tuesday	Wednesday	Thursday	Friday		
Apricots	12,50	8,00	4,50	9,00	11,50	45,50	2,1
Bananas	20,20	12,00	14,20	14,40	17,60	78,40	3,6
Cherries	4,00	2,00	8,00		0,00	14,00	0,6
Clementines	18,20	10,40	8,80	16,00	12,90	66,30	3,0
Clementines + kumquat	4,50	3,50	4,00	1,00	2,00	15,00	0,7
Strawberries	103,50	116,80	96,30	77,60	123,30	517,50	23,5
Kiwis	10,00	11,00	2,50	9,00	10,50	43,00	1,9
Oranges	4,40	4,00	2,40	3,20	4,00	18,00	0,8
Pears	40,40	45,60	22,00	27,60	30,80	166,40	7,5
Apples	231,20	241,75	146,65	202,75	232,30	1054,65	47,8
Prunes	6,00	3,60	3,90	0,90	7,80	22,20	1,0
Prunes/Apricots	4,80	6,00	7,20	2,40	2,40	22,80	1,0
Grapes	6,60	6,00	4,20	3,60	6,60	27,00	1,2
Tomatoes	30,20	22,00	18,10	25,50	19,70	115,50	5,2
<b>Total</b>	496,50	492,65	342,75	392,95	481,40	2206,25	100
%	22,5	22,3	15,5	17,8	21,8	100	

of wholesale cherry tomatoes). 40 % of teenagers did not notice it, 20 % could not answer. Consumption occurred immediately after purchase (92 %) and the fruit was not re-washed (87 %). Purchases were mainly shared between the students (67%) (SEE FIGURE 2).

There was another positive result: customer loyalty. 82 % of teenagers said they “had purchased more than

**FIGURE 2**-In general, you would say... Basis: 172 questionnaires



once”. Elsewhere, as the groups of young people show, it was a case of

transferring from purchasing from one vending machine to another. In actual fact, 60 % of buyers said they visited other vending machines for drinks as well as sweets. With a probability threshold of 95 %, in the worst cases one buyer in two was won over by the fruit vending machine. The labels are rarely read (40 %) and, as might have been expected, two thirds of this customer base disagrees with the observation “the fruit is at a fair price”. In general, what has the impact of the installation of fresh fruit vending machines been?

In response to the question “Since the installation of the vending machine, do you pay more attention to your consumption of fruit and vegetables” a third of buyers said yes, 69 % had talked about it among themselves and 95 % wanted the experiment to continue.

### What about the non buyers?

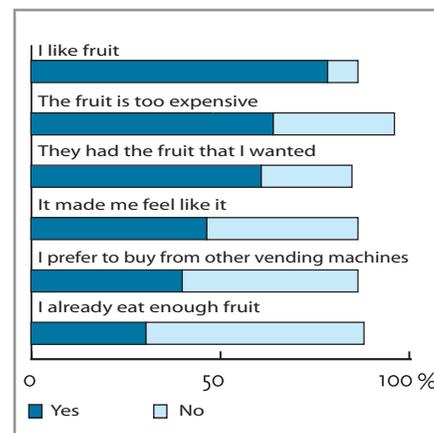
It’s not that they don’t like fruit, or that “the fruit” that they like was not in the machine or even that they already eat enough fruit; the reasons given by the non-buyers were mainly down to price

- for two thirds of them - and a preference for the other vending machines (SEE FIGURE 3).

### Implementation and continuation

Over the period, 4,536 volumes of fruit (or punnets) was sold, being an average of 40 fruits/per day per establishment 57 % of which were apples.

**FIGURE 3**-Why didn’t you buy the fruit? Basis: 62 questionnaires



The turnover went up to 2,206 , of which 51 % represented apples. If the

TABLE 2-Turnover accumulated during the twelve weeks in the two high schools

Product	Size	Price	W9	W10	W11	W12	W13	W14	W17	W18	W19	W20	W21	W22
Granny Smith apples	75-80	0,40 €	■	■	■	■	■	■	■	■	■	■	■	■
Fuji apples	75-80	0,40 €	■	■	■	■	■	■	■	■	■	■	■	■
Cripps Pink cov apples	75-80	0,40 €	■	■	■	■	■	■	■	■	■	■	■	■
Belchard® apples	75-80	0,40 €	■	■										
Abbe Fetel pears	70-75	0,40 €			■	■	■	■						
Conference pears	70-75	0,40 €							■					
Bananas	14 cm	0,40 €	■	■			■	■	■	■				
Oranges	53 mm	0,40 €	■	■			■	■						
Clementines	Cal 1	0,30 €	■	■	■	■	■	■						
Kiwis	2 fruits	0,50 €	■	■	■	■	■	■						
Freyssinette	2 fruits	0,60 €			■	■								
Kumquats*	1	0,50 €			■	■								
Camarosa strawberries**	125g	0,60 €							■	■				
Camarosa strawberries**	250g	1,00 €							■	■				
Gariguette strawberries	125g	1,00 €							■	■	■	■	■	■
Mara wild strawberries	125g	1,00 €												
Darselect strawberries	125 g	0,60 €									■	■	■	
Round strawberries	200 g	1,00 €									■	■	■	■
Cherry tomatoes	125g	0,70 €	■	■	■	■								
Agen prunes	50g	0,30 €									■	■	■	■
Dried apricots	50g	0,50 €									■	■	■	■
Red globe grapes	125g	0,60 €											■	■
Cherries	125 g	1,00 €												■

\* A kumquats was sold with a Clementine for 0.50 W9 = week 9

\*\* Week 79. Camarosa strawberries were replaced with French strawberries.

balance between the turnover and the material cost takes place, then the financial balance sheet is in the red. In actual fact, the fixed costs: depreciation of the equipment, washing of the products, costs linked to restocking, electricity, vehicle depreciation, gas, to which consumables (napkins, punnets, maintenance products etc.) have to be added, and unsold past their sell-by date, have not been included. The request for variety and the preference displayed for fragile fruit increase drop-out rates and the fre-

quency of restocking. To free up the profit, the prices should be higher, but this would risk putting off a target market that does not have much spending power, and, worse, one which presently believes that nothing in this offering justifies paying a higher price. As it is, this project, a positive one in public health terms, is insufficiently remunerative to interest commercial enterprises. In addition, the installation and continuation of fresh fruit vending machines in high schools is itself not a priority, either due to a

reduction in the fixed costs (the machine) or financial solutions that the public authorities could envisage. Finally, in the discussion, the overall reception was favorable, even enthusiastic in some cases and the results are encouraging, but at this stage in the study, possible changes in eating habits have not been demonstrated. However, is the experiment to date too limited to come to a decision about its future already?