

**“Education and Training in Public Schools to change the pattern of consumption  
of foods to prevent overweight and obesity among students through  
“Espacios Saludables / Healthy Spaces”**



## Executive summary

As a result of the explosive increase in obesity in the Chilean population, the food company Tresmontes Lucchetti (TMLUC), in conjunction with the Instituto de Tecnología de los Alimentos (Food Technology Institute - INTA) of the University of Chile, developed a project in 2000 entitled “Intervention in Casablanca schools: a pilot program to prevent and stop childhood obesity in Chile.” This initiative succeeded in reducing obesity indices by 50% and overweight by 25% in the municipal schools that were intervened.

The strategy was undoubtedly a success, and in 2005, with the support of the Cámara Nacional de Comercio (National Chamber of Commerce) (CNC), the Ministry of Health, the Sociedad Chilena de Nutrición (Chilean Nutrition Society), and the Colegio Médico de Chile (Chilean Medical Association), a new project started to be developed, along the lines of a project carried out by TMLUC and INTA, called Espacios Saludables - Healthy Spaces. The job did not look easy, but thanks to the contributions and know-how in different areas of private and public companies and academe, it was possible to put this idea into practice, aimed at promoting the free choice of a healthy life and encouraging physical activity.

To implement the Espacios Saludables initiative, by the end of 2009, it was necessary to build an attractive place that would be different from the space occupied before by a traditional stand. A group of experts in nutrition was formed and established the ranges of nutrients that the food that would be offered at the stand should contain, in order to introduce the sale of healthy products and slowly eliminate the sale of pizzas, hot dogs and potato chips, among other high-calorie foods. Communications and marketing strategies were also established, aimed at the children in a campaign entitled “I have fun eating healthily.” The strategies related the purchase of those foods to play, games and physical activity during recess in order to create a break with the sedentary nature of classroom activities. The concessionaires and providers of the products offered at the stands were also trained in healthy eating, nutrition labeling, and food hygiene and handling.

At the end of one school year, the goal was fully achieved: the children changed their eating habits, considerably reducing the purchase of foods high in fats and sugar, preferring fruit, cereals and other low-calorie food products.

Espacios Saludables is an innovative project that obtained positive results and clearly constitutes a fundamental action in the objective of preventing and reducing obesity among children in Chile, because it not only achieved its objectives in health; it also achieved the objective of educating families about a healthier lifestyle.

## Introduction

With the economic growth at the end of the eighties and the end of malnutrition in Chile, there was an explosive increase in obesity, especially among children. Obesity rose from 7% in 1987 to 16% in 2000 among minors entering first grade, and it rose to 21.5% in 2009, making it the leading public health problem in Chile.

In 2000, in light of this situation and as part of its strategy of Corporate Social Responsibility, Tresmontes Lucchetti invited the Instituto de Nutrición y Tecnología de los Alimentos (Institute of Nutrition and Food Technology - INTA) of the University of Chile to develop an effective model to tackle this public health epidemic. As a result, the project entitled “Intervention in the Casablanca Schools: a Pilot to Prevent and Stop Childhood Obesity in Chile” was created. It was carried out in three municipal elementary schools in Casablanca, which is a rural community in region V, near the metropolitan region.

A school in Quillota (in the same sector) was picked as a control. The strategy of this project was based on an improvement in nutrition and physical activity, achieving a reduction in childhood obesity of 50% and overweight of 25%.

In view of the success of this pilot plan other strategic allies joined in to analyze the feasibility of extending this initiative and replicating it in other communities throughout Chile. As of 2005, with the support of the Cámara Nacional de Comercio (National Chamber of Commerce), Ministry of Health, Sociedad Chilena de Nutrición (Chilean Nutrition Society) and the Colegio Médico de Chile (Chilean Medical Association) the pilot was replicated in all of the public schools in the community of Macul (metropolitan region) with results that were as successful as the results of the pilot plan.

In the years following the implementation of the program in Macul, it was observed that in all public schools in Chile there is a stand/kiosk (point of sale) that sells a wide variety of foods (snacks, soft drinks, ice cream, hot dogs, etc.) that are high in calories. This situation did not favor the consumption of foods that contribute to more healthy nutrition. Consequently, one of the basic needs would be to make sure the school community knows the caloric contribution of different foods and learns the importance of choosing products with low calorie content so that students understand the immediate benefits of healthy consumption of foods on their health and physical condition. It was also determined that it was essential to offer the students choices where they could associate buying foods “with low calorie content” with engaging in physical activity.

On this basis, the Cámara Nacional de Comercio (CNC), through AccionRSE and NutriRSE, associations it is strategically allied with, encouraged Tresmontes Lucchetti to study the feasibility of creating a new project that can be replicated nationally.

This was the origin of the project Espacios Saludables in 2009, which incorporated a third pillar that was the modification of the school environment to favor healthy behavior in the school community. This involved setting up a sector of the school equipped with tables, chairs, games, and a point of sale associated with a supply of low-calorie foods for the children.

## History of the Project

Considering the current epidemiological situation in the world and our country, overweight and obesity are considered to be one of the most important problems in public health and nutrition<sup>1</sup>. Data supplied by the Junta Nacional de Auxilio Escolar y Becas (JUNAEB - National Board of School Aid and Scholarships) show that the prevalence of obesity in about 70% of the children in first grade in Chile reaches 21.5% (P/T > 2 DS, NCHS/OMS)<sup>2</sup>. This health situation in children has been associated with insufficient physical activity and high consumption of foods prepared with a high content of saturated fats, sugar and salt<sup>3</sup>. A study<sup>4</sup> showed that 60% of the students had money to buy foods in school and the most popular choices were packaged sweet products (35%), juice and ice cream (33%), and salty packaged products (30%). Eleven percent bought yogurt and only 7% consumed fruit. The children said they reason they ate unhealthy food was that it tasted good (82%), was available at the stand (46%), and was cheap (38%).

<sup>1</sup> Albala C, Vio F, Kain J, Uauy R. Nutrition transition in Chile: determinants and consequences. *Public Health Nutr* 2002; 5: 123-128.

<sup>2</sup> Ministerio de Educación. Junta Nacional de Auxilio Escolar y Becas. Estado nutricional de escolares chilenos de primer año básico. Santiago, Chile. [http://www.junaeb.cl/mapa\\_nutricional](http://www.junaeb.cl/mapa_nutricional). 2009

<sup>3</sup> Kain J, Olivares S, Castillo M, Vio F. Validación y aplicación de instrumentos para evaluar intervenciones educativas en obesidad de escolares. *Rev. Chil Pediatr* 2001; 72: 308-318.

<sup>4</sup> Bustos N, Kain J, Leyton B, Olivares S, Vio F. Colaciones habitualmente consumidas por niños de escuelas municipalizadas: Motivaciones para su elección. *Rev. Chil Nutr* 2010;37: 178:183.

According to the World Health Organization, there is convincing evidence that a sedentary lifestyle and high consumption of foods with high energy content that is poor in fruit, vegetables, legumes, fat-free dairy products and fish increase the risk of obesity. It has been demonstrated that an appropriate environment at home and in school that encourages choosing and consuming healthy foods could reduce this risk<sup>5</sup>.

The promotion of healthy eating habits and lifestyles in children has become one of the priorities of public health policy in Chile. From this perspective, the Ministry of Health has focused its efforts on the Global Strategy against Obesity (EGO-CHILE), focusing on interventions in public educational establishments based on the INTA-TMLUC pioneer project, “Intervention in the Casablanca Schools: a Pilot to Prevent and Stop Childhood Obesity in Chile,” in order to obtain similar results in the reduction of obesity levels to the ones obtained in Casablanca, to strengthen healthy eating and promote the development of physical activity in schools with curricular and extracurricular activities, and to implement healthy food stands and active recesses, among other actions<sup>6</sup>.

However, the last evaluation of the EGO schools revealed that in the last four years the obesity indices in the one thousand schools intervened by the Ministry of Health increased in first grade students from 19% in 2005 to 21.5% in 2009. On the other hand, only 29% of the establishments comply with the three hours of physical education per week, and fewer than 40% have active recesses and breaks. Most of the teachers do not carry out extracurricular activities related to healthy eating, and the stands continue to sell a wide variety of high-calorie foods<sup>7</sup>, with cookies (with and without cream), salty snacks, soft drinks and juices being the most popular<sup>8</sup>.

Although there are strategies in Chile that promote healthy lifestyles on educational premises<sup>9</sup>, information about validated projects or programs that favor the sale of foods with low calorie content was not available. In view of this, Tresmontes Lucchetti, in the framework of its management strategy, focused on its Corporate Social Responsibility and with the mission of improving the quality of life of the population through balanced eating and stimulating healthy lifestyles, responded to the concern of the CNC. In conjunction with INTA, it has devoted itself to resolving one of the biggest public health problems in Chile: childhood obesity and overweight.

Under the auspices of this alliance an innovative point of sale model called Espacios Saludables was developed, implemented and evaluated in elementary schools. The first step was to determine the barriers children face against buying healthy food and to evaluate the change in the food buying pattern during the school year. This was accomplished by implementing the Espacios Saludables project in a school and comparing it with a control school after one year of intervention. This information was then used to design and implement Espacios Saludables and points of sale and/or stands in the schools in the rest of the country, increasing the supply of healthy food products.

### Objectives and Goals of Espacios Saludables Projects

<sup>5</sup> Organización Mundial de la Salud. Estrategia mundial sobre régimen alimentario, actividad física y salud. 57ª Asamblea Mundial de la Salud. WH57.17. Ginebra: OMS; 2004.

<sup>6</sup> Ministerio de Salud. Estrategia Global contra la obesidad EGO-CHILE. [www.minsal.cl](http://www.minsal.cl)

<sup>7</sup> Morales A. Estudio revela el fracaso el plan para bajar obesidad en 1000 colegios intervenidos. La Tercera. 2010 abril 10; Pág. 25. <http://diario.latercera.com/2010/04/18/01/index.html>

<sup>8</sup> Facultad de Medicina. Universidad de Chile. Tercer Informe. Evaluación externa de las acciones realizadas en las EGO-escuelas para el Ministerio de Salud. Santiago, enero 2010.

<sup>9</sup> Ministerio de Salud. Estrategia Global contra la obesidad EGO-CHILE. [www.minsal.cl](http://www.minsal.cl)

Implement a point of sale model inserted in a “Espacios Saludable”, which is economically viable, increasing the supply of low-calorie foods on educational premises and relating healthy eating with play and recreation.

- A successful intervention.
- Educate teachers about nutritional eating in order to replicate concepts in the classroom.
- Implement a Espacios Saludables that is economically viable for the micro-entrepreneur.
- Obtain authorization from health authorities to operate “Healthy Spaces.”
- Achieve a supply of 80% low-calorie foods at the stands.

### Key Factors to success on the implementation

#### At the Management Level

- o Partnered work between Tresmontes Lucchetti and Ministry of Health, Municipalities, INTA (Instituto de Nutrición y Tecnología de los Alimentos de la Universidad de Chile), AccionRSE, Cámara Nacional de Comercio (CNC).
- o The commitment of all members of the community to fulfillment of the objectives and goals.
- o Work on three fundamental pillars: education in nutritional eating, increase in hours and quality of physical education classes, and modification of the environment.
- o Reinforce the creation of micro-enterprises around Espacios Saludables.
- o Reinforce and train low-calorie food suppliers in the community.
- o Replication of Espacios Saludables model in municipal and private schools in Chile.

#### At the Operations level

- o Sensitization and commitment of leadership of the school, teaching team, concessionaire of the “Healthy Space,” suppliers, parents, guardians, and students.
- o Limitation of food vendors in the streets close to the schools.
- o Determination of concession modality for the Espacios Saludables and economic agreement with concessionaire.
- o Diagnosis to be made before implementation.

### Key Indicators for Evaluation

The evaluation of the indicators involves comparing the performance of the variables over time with prior measurements, during and after the intervention on the following points:

- Nutritional condition
- Supply of low-calorie foods
- Price of low-calorie foods
- Food preferences during purchase of foods from stands at schools
- Economic feasibility for concessionaire of healthy point of sale
- Sports and games equipment for students and schools

### Training

The implementation of a Espacios Saludable includes sensitizing and training the whole school community, the person in charge of the intervention, the personnel that serves at the stand, and the suppliers of the stand in order to manage the following concepts:

- *Healthy eating*: enables the concessionaire and teachers at the school to identify the characteristics of healthy eating. This information supports the choice of foods and the dissemination of information in the Healthy Space.
- *Nutrition labeling*: makes it possible to choose foods according to their nutrient content.
- *Food handling*: emphasizes the importance of appropriate handling of products in preventing gastrointestinal diseases. It is also important in order to comply with the requirements established in the Food Health Regulations.
- *Promotion, communication and sales strategies*: which encourages the target group to prefer low-calorie foods that relate play and recreation with the choice of healthy foods.



### Budget

Construction of “Healthy Space”: cost ranges between CLP\$ 4,000,000 and CLP\$ 10,000,000 (USD 8,000 - USD 20,000)

### Gantt chart

In order to carry out this kind of project, planning is necessary to make a critical, objective and systematic analysis of the results obtained in relation to the proposed goals, the strategies used, and the resources assigned.

The program includes a Gantt chart that makes monthly and annual visualization possible. It is broken down into: Diagnosis, Implementation, Measurement, Evaluation, Results and Post-Intervention Follow-up.

### Mechanism of evaluation and continuous improvement

- Permanent advisory services about the kind of foods to be offered at the stand and identification of critical nutrients, food handling and hygiene, health permits, and communication and marketing strategies to increase sales of low-calorie foods.
- Periodic and systematic supervision in the field of proposed activities, through follow-up and analysis of the indicators and comparison with the control school.
- Monthly meeting of coordinators with technical heads of the educational premises.

- Quarterly evaluation meeting with all the project leaders. (Municipality Mayor, INTA Director, Director of the Municipal Corporation, Community Director of Education and Health, CNC, Tresmontes Lucchetti).

### Implementation of the Espacios Saludables in Public Schools in Chile

The pilot project was carried out at two municipalized public schools, one of which was intervened, the Villa Macul D-200 School, and the control school was José Bernardo Suárez No. 167. The two schools were chosen because they had “points of sale” with a similar variety of foods, there were no street vendors of food at the gates or surrounding streets of the schools, and they include children of a similar socioeconomic level<sup>10</sup>.



The sample consisted of the total number of children in grades 4 to 7 (10 to 12 years of age), which was 477 children (291 in the intervened school and 115 in the control school).

A Espacio Saludable was built in one area of the school, which consisted of a stand, tables, chairs and games with bright colors and attractive designs. The stand was built in accordance with the Food Health Regulations<sup>11</sup> and it was designed to make the foods on sale as visible as possible.

A group of nutrition experts was formed that established the ranges of nutrients the foods should contain that would be sold at the stand. Processed foods should not contain more than one portion of food per container, and the portion should not exceed 130 kcal, 3 grams of fat, 20 grams of carbohydrates, and 140 mg. of sodium. A standard portion of 150 grams was considered for fruits and vegetables and 30 grams for dry seeds. It was also determined that the dairy products offered should be semi-fat or non-fat; soft drinks, water, or juices should be “light”.

In order to introduce the sale of low-calorie processed foods and healthy foods, the sale of pizzas, hot dogs, potato chips, ice cream and popsicles, soft drinks and juice containing sugar was progressively eliminated. In parallel the sale of 30% of low-calorie foods was incorporated. The percentage was increased to 60% after six months of intervention and to 80% at the end of the year.

<sup>10</sup> Ministerio de Educación. Junta Nacional de Auxilio Escolar y Becas. Estado nutricional de escolares chilenos de primer año básico. Santiago, Chile. [http://www.junaeb.cl/mapa\\_nutricional](http://www.junaeb.cl/mapa_nutricional). 2009

<sup>11</sup> Reglamento Sanitario de los Alimentos. Gobierno de Chile, Ministerio de Salud [http://juridico1.minsal.cl/977\\_de\\_1996.doc](http://juridico1.minsal.cl/977_de_1996.doc)



As a way of encouraging the purchase of low-calorie processed foods and healthy foods, communication and marketing strategies were established in a campaign entitled “I have fun eating healthily,” which related the purchase of healthy foods with play and recreation, handing out sports implements, ping pong paddles, coupons for weekly drawings for prizes along with the purchase of those foods, among other strategies. An information board was also set up that exhibited different subjects related to the promotion of healthy lifestyles and the supply of foods sold at the stand.

The concessionaires of the stands were trained in healthy eating, nutrition labeling, and food handling and hygiene, along with communication and marketing strategies, to promote the consumption of healthy foods.

Through a survey of eating habits, the origin of the snacks, the children’s available spending money, food preferences in buying, and their motivations to buy high energy foods were determined<sup>12</sup>. The questionnaire included 10 questions about eating behavior and habits related to foods consumed during the school day, the availability of money to buy food, together with the motivations and barriers to their choices. The questionnaire was applied at the beginning (time 1) and when finishing the implementation of the healthy stand (time 2) in the intervened school and the control school.

Statistical Analysis: after finishing the validation of the data, the results of the survey were analyzed descriptively through graphs and tables of frequencies for each time (before and after the intervention) in

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12 Olivares S, Kain J, Lera L, Pizarro F, Vio F, Morón C. Nutritional status, food consumption and physical activity among Chilean school children: a descriptive study. Eur J Clin Nutr 2004; 58: 1278-1285

the intervened school and the control school. A comparative analysis was then made between the two schools, considering the starting and ending values (delta) of the food the children consumed and the evolution of barriers against consuming more healthy foods, using the Wilcoxon test for independent samples. The analysis was made with the STATA 10 and SAS 9.2 statistical program of the Statistical Unit of the INTA<sup>13,14</sup>.

## Results

Table No. 1 shows the foods that children brought to school from home, with and without “Healthy Spaces.” The children’s snack preferences at both schools inclined largely toward fruit, yogurt and juice. In comparing changes over time it is important to point out that children in the control school increased their preferences in snacks for less healthy foods like salty snacks ( $p=0,0181$ ) while children in the intervened school increased their preferences for healthier snacks, like cereal bars ( $p= 0.0341$ ).

**Table No. 1: Comparison of foods (%) that children bring from home, at the beginning and the end of the project between schools with and without healthy stands.**

Foods brought as snack	Without healthy stand		With healthy stand		Value p
	Time 1	Time 2	Time 1	Time 2	
Fruit	28.3	30.5	38.5	37.0	0.5141
Milk	13.5	17.5	16.7	16.5	0.3384
Yogurt	29.6	30.5	32.3	38.3	0.3398
Soft drinks	13	14.2	11.4	10.5	0.1078
Juice	34.1	31.1	36.6	42.0	0.1736
Salty Products*	10.3	21.4	8.3	10.2	0.0181
Sweet Products	17.4	22.8	22.6	21.5	0.1989
Cereals	11.6	9.0	13.7	14.6	0.3055
Cereal Bar*	9.0	15.5	16.4	13.7	0.0341
Sandwich	20	16.23	22.05	23.68	0.2868
Dry seeds	5.16	3.90	1.55	2.18	0.3633

\* Significant change between control children and intervened children, value  $p < 0.05$

Table No. 2 shows the foods that children buy at both kinds of school. The preferred foods when buying (over 25% of preferences) are salty snacks, sweet snacks, juice and ice cream. When comparing changes over time, one sees that children in the school with a healthy stand increased their preference for fruit, milk, yogurt, light juices, healthy sandwiches, dry seeds and popsicles ( $p < 0.05$ ) and salty snacks (this was due to the fact new products were incorporated with lower sodium content; however, all of them exceeded 140 mg of sodium per portion of food).

On average, children have USD 0.55 per day to buy food at the stand in school; no significant differences were noted between the children at the two schools, at the beginning and the end of the study. Regarding the barriers the children faced against buying healthy snacks, like the smell, taste, high price and low supply of healthy foods in the schools, the children at the intervened school tended to eliminate the barrier of low supply of healthy foods compared with the school without a healthy stand. ( $p < 0.0001$ )

13 STATA. Stata 10. Stata Corporation. College Station, USA; 2004

14 SAS. SAS Institute Inc. (2002), SAS/STAT Software: user’s guide, Release 9.2. Cary, NC: SAS Institute, Inc.

**Table No. 2: Comparison of foods (%) children buy at the stand in school at the beginning and the end of the project between schools with and without healthy stands.**

Foods purchased	Without healthy space and stand		With healthy space and stand		Value p
	Time 1	Time 2	Time 1	Time 2	
Fruit*	8.3	8.5	6.2	21.6	0.0008
Milk*	12.2	5.6	10.2	16.4	0.0045
Yogurt*	16.7	12.0	9.9	23.4	0.0003
Drinks with sugar*	14.8	22.7	16.4	8.8	0.0011
Juices without sugar*	34.8	42.5	30.7	53.1	0.0216
Salty Products	32.9	53.9	26.7	41.3	0.3391
Sweet Products*	38.0	50.3	35.0	14.6	0.0001
Cereals	9.0	13.4	10.8	8.7	0.2063
Cereal Bars	10.9	14.8	14.2	15.0	0.4453
Fried Tortilla*	7.7	17.7	2.17	-	0.0004
Sandwich*	4.52	2.13	3.11	15.02	0.0003
Dry seeds*	8.39	2.84	4.66	13.55	0.0001
Popsicles*	35.48	58.16	34.47	45.79	0.0479

\* Significant change between control and intervened children, value  $p < 0.05$

## Conclusions

The project Healthy Spaces evidenced that it is possible to change the eating habits in children if the information is conveyed in an educative and entertaining manner. The project also showed that children are able to freely choose a healthy snack, like a fruit or cereal bars instead of high sodium or calorie content snacks, like salty products and ice cream. On the other hand, the role of the healthy stand as well as the environment around it, with games and activities of interest for the students, and which at the same time encourages teachers to incorporate to this space, facilitates the development of physical activities during recess periods preventing children from maintaining the typical more calm activity of the classroom.

The implementation of a sales point showing a wide range of products, gives children the chance to choose the foodstuffs that appear more attractive to them. Training provided to concessionaires of the points of sales was crucial in this respect, as well as, to the supplier of products to be exhibited. On the other hand, the fact that the transformation of the old point of sales into a Healthy Space did not imply a significant investment to the concessionaire—which was rapidly recovered through increased sales—, and resulted in immediate, evident benefits for the parties, as well as giving the opportunity to suppliers to obtain new income through the sale of novel products, makes this project easy to replicate in other Chilean schools and in other countries.

Another crucial aspect for the project's success was the generation of attractive communication strategies associated with physical activities, like, "Buy an apple and take a ping pong coupon," as it immediately generates a preference for healthy products, which in the long term will turn the option for health products a conscious action.

Considering the enormous benefits that this initiative will have on Chile's national plans to reduce and prevent childhood overweight and obesity, given the enormous damage that these two epidemics have on public health; the fact that they are initiatives that are relatively easy and inexpensive to implement; the benefits for the families of the children as they have an influence on their eating patterns, changing them for a more natural and healthy way of eating; and to the local community, as these new points of sale represent a possibility of generating income to suppliers, we consider that this valuable and innovative project must be preselected as one of the finalists for this competition of the World Chambers Federation, in the Corporate Social Responsibility category.