

# School breakfast and healthy nutritional education in elementary school

Desayuno escolar y educación nutricional saludable en escuelas primarias

Pequeno almoço escolar e educação nutricional saudável na escola primária

Petit déjeuner scolaire et éducation nutritionnelle saine à l'école primaire

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DOI: 10.19136/hs.v16i2.1474

## ORIGINAL ARTICLE

Date received: november 11, 2016. Date approved: march 02, 2017.

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## Abstract

**Objective:** To identify opportunity areas in elementary school to develop integrative educative process for health education in food.

**Materials and methods:** A case of study in 30 elementary schools in a Tabasco was made. About 9293 students were attended. Data was collected and defined by elements of analysis in observations and interviews.

**Results:** Most schools had at least minimal infrastructure for an integrative breakfast preparation and development of the content teaching projects. There were identified three primordial problems: A) in the scholar's breakfast practice there was a dynamic that does not follow the guidelines of the governmental office that regulates them. B) The preparation and distribution of meals was unrelated with the teaching of content. C) There were contradictions in the contents of different educational materials and among these contents and scientific evidence.

**Conclusions:** Nevertheless infrastructure breakfast preparation and subject teaching was cut oneself off. The results of this search are the basis for the design of educative strategies that integrate content from various school subjects, and the development of scholar projects that involve students, teachers, and families to join the activities of food preparation with the construction of concepts, skills and values.

**Keywords:** Healthy feeding; Health education in food; Food attitudes; Innovative programs.

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## Resumen

**Objetivo:** Identificar las áreas de oportunidad en la escuela primaria para desarrollar procesos educativos integradores para la alimentación saludable.

**Materiales y métodos:** Se hizo mediante un estudio de caso en 30 escuelas de primaria de una zona escolar del estado de Tabasco, México, en las cuales se atendía a 9293 educandos. A partir de elementos de análisis definidos previamente se colectaron datos mediante observaciones y entrevistas formales e informales.

**Resultados:** La mayoría de las escuelas tenía al menos la infraestructura mínima para el desarrollo de procesos que integren las actividades de la preparación de desayunos escolares y la enseñanza de contenidos. Se identificaron tres problemas primordiales: A) La práctica de los desayunos escolares seguía una dinámica propia que no seguía los lineamientos de las guías que los deberían regular B) La preparación y distribución de las comidas no se relaciona con los contenidos de enseñanza C) Hay contradicciones entre los diferentes materiales educativos y entre los contenidos y la evidencia científica.

**Conclusiones:** A pesar de la infraestructura las actividades de preparación de los desayunos y la enseñanza de contenidos están desvinculadas. Los resultados muestran las bases para el diseño de estrategias educativas para integrar los contenidos de varias asignaturas, y el desarrollo de proyectos escolares que involucren estudiantes, maestros, y familias en conjunto para actividades de preparación de las comidas con la construcción de conceptos, habilidades y valores.

**Palabras clave:** Alimentação saudável; Educação para uma alimentação saudável; Atitudes alimentares; Programas inovadores

## Resumo

**Objetivo:** Identificar áreas de oportunidade na escola primária para desenvolver um processo educativo integrador de uma alimentação saudável.

**Materiais e métodos:** Foi realizado um estudo de caso em 30 escolas primárias em Tabasco, México, nas quais frequentavam 9293 alunos. A partir de elementos de análise definidos, os dados foram colhidos através de observações e de entrevistas formais e informais.

**Resultados:** A maioria das escolas apresentava infra-estruturas mínimas para o desenvolvimento de processos que integram as atividades de preparação do pequeno-almoço e de leccionação dos conteúdos. Identificaram-se três problemas primordiais: A) A prática de pequenos-almoços escolares apresentava uma dinâmica própria que não seguia os guias orientadores B) A preparação e distribuição das refeições não estão relacionadas com o conteúdo dos ensinamentos C) Existem contradições entre os conteúdos dos diferentes materiais educativos e as evidências científicas.

**Conclusões:** Apesar da infra-estrutura, as atividades de preparação dos pequenos-almoços e as de ensino não se relacionam. Os resultados desta pesquisa podem servir de base para a concepção de conteúdos nas várias disciplinas escolares e para o desenvolvimento de projetos escolares que envolvam estudantes, professores e famílias nas atividades de preparação de refeições, permitindo a construção de conceitos, habilidades e valores.

**Palavras-chaves:** Alimentação saudável; Educação para uma alimentação saudável; Atitudes alimentares; Programas inovadores

## Résumé

**Objectif:** Identifier les domaines d'opportunité à l'école primaire de développement de processus d'éducation inclusive pour une alimentation saine.

**Matériaux et méthodes:** Une étude de cas a été réalisée dans 30 écoles primaires d'une zone scolaire de l'État de Tabasco, au Mexique, où assistait un total de 9293 étudiants. Les données pour l'analyse ont été recueillies en fonction d'éléments précédemment définis au moyen d'observations et d'entretiens formels et informels.

**Résultats:** La plupart des écoles avaient au moins les infrastructures minimales pour le développement de procédés qui intègrent la préparation des repas scolaires et l'enseignement de contenu. Trois problèmes principaux ont été identifiés: A) La pratique des petits déjeuners scolaires suivait une dynamique propre qui ne correspondait pas aux lignes directrices des guides qui devrait réglementer B) La préparation et la distribution des repas ne sont pas en accord avec le contenu de l'enseignement C) Il existe des contradictions entre les différents matériaux éducatifs, et entre les contenus et l'évidence scientifique.

**Conclusions:** Malgré l'infrastructure existante, les activités de préparation des petits déjeuners et l'enseignement de contenus sont dissociés. Les résultats indiquent les bases pour la conception de stratégies éducatives intégrant les contenus de plusieurs matières et le développement de projets scolaires qui impliquent à la fois les élèves, les enseignants et les familles dans les activités de préparation des repas, associant la construction de concepts, d'habiletés et de valeurs.

**Mots-clés:** Alimentation saine; Éducation pour une alimentation saine; Attitudes envers la nourriture; Programmes novateurs.

## Introduction

Non communicative diseases (NCD) have been increasing their prevalence dramatically in Mexico during the recent decades; only type 2 diabetes mellitus is a direct cause of 60,000 deaths per year in adults along with other negative aspects of lifestyle, antecedent 75% of the general morbidity burden in the country. The increase in the prevalence of these diseases affects all social strata. In 2010, in the 100 municipalities of greater human development index of Mexico the mortality of women of all ages for type 2 diabetes mellitus (T2DM), ischemic heart disease, stroke and hypertensive heart disease was 39.59% of all causes. In the 100 municipalities of lower index, the proportion of deaths for the same four diseases in women of all ages was 24.7%, though the extreme poverty the malnutrition caloric multifaceted and the anemia accumulated were caused of 9.7% of the deceases<sup>1</sup>.

This correlates with the changes in food consumption patterns that affect those who can acquire food as those who can't and that has been observed in other human groups<sup>2,3</sup>. In Mexico, the traditional pattern-based foods made from corn and beans with variety of fresh vegetables, went to a high consumed of modern industrialized food where processed meats, industrial pastries, snacks and soft drinks or sparkling stand out, especially after the launch of the North America Free Trade Agreement between Mexico, United States and Canada<sup>4</sup>. Therefore it is necessary to emphasize the role of the school (especially in elementary school that is the only one that has access to a significant portion of the population in Mexico) for the formation of life skills.

The elementary school practically has an universal coverage and has distributed to learners the "Free textbooks," for about 50 years, but some of its contents does not provide the learners elements to confront difficult situations in real life<sup>5,6</sup>. In the case of diet, many of the messages of natural science books do not allow the acquisition of basic notions for infants to face, with a critical stance, the messages sent by the media. For example, in the fifth grade textbook, it is read "avoid 'excessive consumption' of processed foods, sodas, chips," with what it results in a permissive message, opposite to the formative needs for a healthy lifestyle since it is not explained when this consumption is excessive<sup>7</sup>. The conceptual base of the recommendations that are given to the pupils for the supply takes the equivalences as a sustenance with base in the nutriment and is not opposed to the messages of the industry of food and drinks, like it might do if it was sustained in complete and culinary food<sup>8,9</sup>.

The illustration "Plate of Good Eating" promotes misconceptions among which industrial baked products made with refined flour (sugary breads and pancakes) are

equated with whole maize tortillas, as well as red meats with fish or all kind of beans,<sup>10</sup> which have been during millenniums the base of the supply in Mexico. On the other hand, in great quantity of the public schools were developed the program of school breakfasts, which aim is to contribute to the nutritional improvement of the infantile preschooler and scholar population, the academical achievements and the decrease of the absenteeism in children, not only those who are in risk of malnutrition or live in isolated zones.

The organism at the expense of these practices is the Municipal Subsystem of the Integral System for the Development of the Families (DIF), which has wide limits that are adapted to the different regions of the country. In general, the DIF provides a food package that can be used to elaborate warm meals, though it can also provide the "cold breakfast". The labors of the preparation are at the expense of family mothers that receive a symbolic payment, and have supervision of the DIF employees.

This activity is not joined to the educational labors for what it turns interesting to analyze the conditions in which both are done. They might derive strategies to re-mean these practices from there so that the production of the employed food in breakfasts become a part of the process of placed education, understood as the school practices in real life situations. The learning with base in projects proposed by the Secretariat of Public Education of Mexico in the 2011 plan of studies, favors the incorporation of conceptual, procedural contents and values of different subjects in class projects, of community and of citizenship. The start of this strategy would allow the development of whole school programs in nutrition, sustainability, sciences, especially because it considers cultures, traditional manners of life, history, the community where the pupils live<sup>11</sup>. That way they might be instruments that take place in the breakfast's preparation in the context of the food selection according to its nutrimental, social characteristics and costs, as well as the importance of their culture, their environment and the biology in the preparation of those foods.

The practices inside the schools that were related to the nutrition of children, especially for the production of the school breakfasts, as well as the conditions in which these are carried out. In the present article we try to demonstrate principally three things. A) The existence of a dynamic that obeys its own guidelines in the preparation and distribution of the school breakfasts in the schools which provide them. B) The existing dissociation between the activities for preparing the meals and teaching. C) The contradictions between the

conceptual contents that are handled in the school that is found in the diverse educational materials; because of that, they are permissive for the consumption of products of the industry of food and drinks. Though the scope of the study is limited since only a part of a region of a state of Mexico was analyzed (Tabasco). It sheds the possibility of elaborating educational projects of integration and that consider contents of diverse subjects, the culture, the economy and the biological background of people.

## Materials and methods

There was realized a qualitative investigation study case of type during the second semester of the school cycle of basic education, elementary level, 2011-2012, from January to May, 2012 in the municipality of Centro, in Tabasco, in the South-east of Mexico.

It was selected one of the sectors of the municipality of Centro, where 70 school campuses toil, which were codified and were selected by means of a drawing. The schools were visited and there were obtained reports that emptied to a database until new categories couldn't be identified for each aspect to be analyzed, which happened after visiting 30 campuses. The study included observations of the scholar space, the context in which it was located, as well as the characteristics of the school's cooperative, which is the shop where diverse products are sold to the pupils, both the allowed ones and the restricted ones in agreement to the guidelines of the Secretariat of Education; interviews were also done and educational materials were reviewed, such as books and cartels, about nutrition, that were part of the supply that was in the school.

The context of investigation was to delimit the meanings, practices, roles and life styles about the alimentation in the primary schools. The exploration of the scholar context was made through the participant observation. Roles and practices, in relation to food, of the pupils, their families and teachers were analyzed. As social role it was understood "a set of interactions with a member or members of other social categories," such as wife or son/daughter. Therefore, they were defined "from the regularities in the patterns of relationships between actors, not parting from the attributes of the actors themselves"<sup>12</sup>. The definition of social practices was "doing the people and their relationship with others and with space"<sup>13</sup>. The lifestyle was defined as the set of behaviors of a subject<sup>14</sup>, from which for this study were only considered from the scope of the food selection without the caloric intake or the amount of daily food being adjusted. The consumption pattern classification was made based on the names of the key nutrients preparations in each case

which allowed the determination of the consumption patterns: traditional (when prepared with predominance of local products without major modifications and traditional recipes are employed) and modern-traditional (when there is high consumption of refined flours, processed products such as purees high in sugar, meats of all kinds, and the recipes are similar to those of fast food chains)<sup>3,15</sup>. The lifestyles were determined according to the type of food consumed by majority so it was also ranked in traditional or modern.

To collect the data from the school and its surroundings it was used a field diary. The observations were focused to: 1) the media management in scholar foods, 2) the presence of supports for the food administration, 3) the availability of infrastructure, equipment and materials, 4) the type of merchandise that was expended in the school cooperative, 5) the type of food that was being sold in the surroundings of the school. Guides were also elaborated in order to do formal and informal interviews to teachers, executives, personnel of support of the schools, mothers and pupils. The questions collected information about the: 1) estimated of children that flocked to school without having breakfast, 2) the type of food that the children were receiving in their houses for breakfast, 3) the criteria of the managers for the elaboration of a breakfast or a snack, 4) the guidelines for the production of the school breakfasts, 5) the availability and the use of the materials of support on alimentary education, 6) the knowledge of the school contents related with nutrition.

The project had record in the Secretariat of Investigation of the Universidad Juárez Autónoma de Tabasco and it was a part of the "Strategy of educational intervention for the alimentary health" project with the key POA-2011-0026. Authorization was requested to the Secretariat of Tabasco's Education for the research. The study fulfilled with Helsinki's dispositions. It also became attached to be arranged in the regulation of the General Law of Health as for Investigation for Health in Mexico. The participants possessed enough information about the study by the informed assent, their participation was voluntary and they were free to finish the interview in the moment they wanted

## Results

With the intention of identifying the context in which whole school nutrition programs can be realized in Tabasco, Mexico, an exploration was carried out in selected schools of the municipality of Centro.

### *School characteristics*

Though most of the schools were out of the capital city, in suburban zones, by the characteristics of transport,

communications and availability of products of the industry of food and drinks were considered to be of urban type.

To this is due that the number of rural-type schools, those established in sparsely populated hamlets or villages, became lower. The schools had three shifts: morning from 8:00 to 12:00, evening shift from 14:00 to 18:00, and full or expanded; those that had activities in both schedules. There are more morning schools than evening schools in the analyzed zone, and because of that, they are completed, this is reflected in the sample. The schools were attending children of both genders distributed in groups according

to the school grade, the unigra, or those who only rely with one teacher for all the children, the multigra schools, which in the sample of study were those of rural location (Table 1)

main reason for their non-presence in formal health science education.

The modalities most offered are: master's degree subject (24.39 %), courses (19.5 %), and diplomas (17.07 %). It is also offered as a specialty and workshop subject (12.19 %), with the lowest proportions (7.31 %) being for training and a specific master's degree in the subject (Table 1).

**Table 1. Characteristics of the 30 schools in Centro, Tabasco, México**

Categories			
	Schedule	Type	Location
Frecuence (%)	Morning 20 (66.6)	Unigra 24 (80)	Urban 24 (80)
	Evening 9 (30)	Multigra 6 (20)	Rural 6 (20)
	Complete 1 (3.3)		

**Note Font:** Our data

#### *Scholar Breakfast*

The schools were not settled in areas considered marginalized, which is no longer a condition for the school breakfast established program and 18 schools in the sample (60%) provided some type of food at a rate of 25 to 50% of their school population, and there were 9293 given education. There were only five from 12 (16.6%) which did not have the facilities and tools needed to prepare and distribute food to learners (butane gas stove, pots, pans, dishes and glasses, tables to eat for children). Twenty five (83.3%) schools had an eating lounge for kids. They had air conditioning in the lounge in 4 of the schools. From those in which the program was, 16 (53.3%) used it at 10:00, two hours after the beginning of class, 2 (6.6%) knew the schedule and only 2 (6.6%) of the 9 afternoon shifts, gave snacks to the children, one of these schools was full time, so the food was served at 12:00 (Table 2).

In agreement to the answers of the mothers in the breakfast in the house the culinary preparations the traditional type was more frequent since they were incorporating products as maize tortillas, pozol (Mayan drink done with a base in maize), fried "Tabasco" bananas, tubers of local production (yuca, macal, malanga, sweet camotes) though in the children's answers was found that they rarely consumed

fruits and vegetables in breakfast as soft drinks with gas as well. These complemented themselves because in the preparation for children in the school's campuses there were abounding more with base in industrialized modern not advisable food: noodles, cereals for breakfast<sup>16</sup>, mashes of tomato with only 8 % of tomato pulp and 30 % of sugar<sup>17</sup>, hams and sausages that have sodium and nutrients<sup>18</sup>, it encreates from milk, refreshments were done with base on flavored syrups of "Orgeat" and "Hibiscus", industrialized preparations of traditional drinks with rice and flower Hibiscus sabdariffa base (Table 3).

This happened even when the pantries that were provided in the DIF did not include some of these foods. The explanation of who prepared the food was that in that way the kids did not waste food. In fact only 3 (10%) of the schools were using in an exclusive way the food of the DIF. Either because they were not enough or because those who were preparing the food were thinking that it was not attractive for the children, in 16 schools (53.33 %) the parents were buying food to complement the preparations. Another fact was that those who were in charge of preparing the food in the schools were changing it, for example, the dried soy beans for sausages or milk cream.

**Table 2. Roles and activities about the alimentation in 30 schools of Centro, Tabasco, México**

Categories	Levels <i>f</i> (%)				
<b>Infrastructure for preparation and consumption</b>	No space or materials	or	Cookware and essential furniture	Also blender and juicer	Also with microwave oven
	6 (20)		17 (56.6)	5 (16.6)	2 (6.6)
<b>Inputs for the preparation of meals</b>	They were not enrolled		Only those of the DIF	They received from the DIF and buy	Parents buy them
	12 (40)		-	14 (46.7)	4 (13.3)
<b>Responsible for the preparation of meals</b>	They were not enrolled		Mothers committee	Mothers who get a pay	
	12 (40)		16 (53.3)	2 (6.6)	
<b>Supervision to the meals program</b>	They were not enrolled		Only the introduction	Personnel of the DIF each semester	
	12 (40)		8 (26.6)	10 (33.3)	
<b>Regulation documents</b>	They did not have		Only a menu	Menu and regulations	Few texts
	11 (36.3)		15 (50)	2 (6.6)	2 (6.6)
<b>Attached documents</b>	They did not have		Gave other kind of food.	Follow the written instructions	
	12 (40)		16 (53.3)	2 (6.6)	
<b>Type of product that is sold in the school cooperative</b>	Industrial pasty, snacks, soft drinks		Sandwichs, and other mother's preparations	Mainly fruits and vegetables	More than one type of product
	9 (30)		3 (10)	2 (6.6)	16 (53.3)
<b>Outlets in the periphery</b>	There was not near		Nearby, on the roads to the school	In the block where the school	
	4 (13.3)		11 (36.6)	15 (50)	
<b>Source of nutrition contents</b>	Only the free textbooks		In addition, in the school library	In addition, in other libraries	
	20 (66,6)		9 (30)	1 (3.3)	
<b>Posters about food in the dining room</b>	They didnot have		Only "The Plate of Good Eating"	Various types of posters	
	10 (33.3)		11 (36.6)	9 (30)	

Note Font: Our data

**Table 3. Classification of meals according to the main ingredients**

	<b>Modern</b>	<b>Traditional</b>
	Number of meals, 26.	Number of meals, 40.
<b>Home</b>	Examples: 1) Spaghetti with cheese and industrial tomatoes puree. 2) Long pasta and potatoes soup.	Examples: 1) Beans soup with unripe “macho” bananas and tortillas. 2) “Puchero de res”, meal with local vegetables (chayote, malanga, yuca) soup.
	Number of meals, 10.	Number of meals, 3.
<b>School</b>	Examples: 1) Ham sandwich with mayonnaise and catsup. 2) Short pasta with sausages and industrial tomatoes puree.	Examples: 1) Lentils with fried “macho” bananas. 2) Beans soup with maize tortillas.

**Note Font:** Our data

#### *Development of the classes*

The scholar activities for the healthy nutrition are based almost in an exclusive way in the contents of the “Free Textbooks” distributed by the SEP (Table 2) and in practices of repetition and memorization that are principally evaluated by test type exams. This was due to the implementation of the National Assessment Tests of Academic Achievement in Schools (ENLACE for its capital letters in Spanish) —Similar to the program of standardized tests to evaluate teachers and schools” Race to the Top “of The United States— by means of which it is tried to become explicit: “the measurement in which the student body dominates the content of the learning that was evaluated”(sic) (<http://www.enlace.sep.gob.mx/>). This was found to be the same for the education as the sustainability that was established as ‘of interest’ by the SEP in recent years that counts with its own areas of opportunity in the form of gardens and orchards which are not part of the teaching activities. The contents of the “Textbooks” have a sequence of increasing complexity over the years of schooling, they are emphasized in third grade and some concepts are only mentioned in fifth and sixth grades. For example:

—This book does not have information about nutrition, or anything related to food (fifth grade teacher).

Most messages in the book of third grade doesn’t present any logical sequence towards food selection and the

preferences of those who are healthier<sup>7</sup>. Since teachers do not have references to scientific advances about food that wasn’t expected to have discrepancies with the content:

— It makes clear to what it is what it’s used in what we eat, for example to grow, to be strong, also what would happen if we do not eat adequately. Moreover, it also makes clear what kind of food we must consume and the quantities and how they must be combined, it also speaks about “The Plate of the Good Eating” and as how to use it, “The Jar of the Good Drinking”<sup>19</sup> and how to use it, it makes clear to us what a diet is and I also liked it because it brings a mini-project for the implementation about a school’s garden which it is necessary to have (teacher of third grade).

There were found some contradictions about them when we were checking the different contents of educational materials. For example, in the “Manual for the preparation and hygiene of food and drinks in the establishments of school’s consumption in the campuses of basic education”<sup>20</sup>, it is said that children can replace school meals for industrial baked products. In the quaternion “How to prepare the school refreshment and to have a healthy nourishment”<sup>21</sup> it is recommended the cereal of box that could have up to 30 % of sugar<sup>16</sup>. In the same quaternion it promotes that the children could drink liquid yogurt, fruit juices, and nectars, whose consumption must be avoided according to other scholar text<sup>19</sup>. These faults

are not perceived by the teachers, since the referring that they have the graphical representation "The Plate of the Good Eating", shares with the graphical representations of other countries, as "My Plate" of The United States, axes in the ideas of the equivalence of the food and the count of calories

- I like the drawing of "the plate of the good eating" because it is easier to explain my pupils about the topic. For me, as a teacher who doesn't know much about food, it is a simple way to explain how the plate is distributed (teacher of fifth degree).

## Discussion

An investigation of type of study of case was realized in a region of a municipality of the state of Tabasco, in the south-east of Mexico, to analyze the conditions in which the preparation of the school breakfasts are affected, on the one hand, and the educational practices, moreover. The fundamental intention of this research to stimulate educational processes where the teachers and the pupils, the families, took part in the selection of nutritional recipes, sustainable ecologically and economically, based on the local products, which rescue their cultural values because the traditional cooking provides bioactive components in addition necessary for the normal function of the human being<sup>22-24</sup>. These educational processes are needed to modify lifestyles, since according to the patterns of consumed food, this was based on products of the industry, and there is evidence that correlates these foods to non-communicable chronic diseases<sup>2-3,25</sup>.

### *The scholar breakfasts as an area of opportunity*

The program of the school breakfasts has limits and supervision, but in this sample it was found that the schools in which there was an introductory conversation at the beginning of this program, they were provided with an (60 %) only. 10 of them got a (33.3 %) so they were supervised when they finished the semester (Table 2) for what it is necessary to construct mechanisms of continuous congruent assessment with the guidelines and school materials to support with base in the scientific evidence and not in the idea of the equivalencies of the macronutrients. The review of menus is another area of opportunity (the only source of information in 50 % of the schools) since in different versions of which there are provided by the DIF and in the manual for mothers and family parents<sup>21</sup>, distributed in all the schools of the country, there are found recommendations that do not adjust to the healthy nutritionist from the perspective of them being more important the characteristics of the components of the food more than the equivalences of macronutrients<sup>26-27</sup>. On the other hand though, the teachers, the families and the students mentioned differences between "healthy food "

and "junk food" they were consuming. The last one in a daily way which demonstrated differences between what it is said and what it's done, between the information that it is received and the patterns of consumption, same that has been observed in other researches<sup>28-29</sup>.

### *The project development as an area of opportunity*

In a different way to other studies in which materials were elaborated for their classrooms use, where the equivalence of the macronutrients and the evaluation of the courses were focused to persist by means of examinations of test type<sup>30</sup>, this investigation considers the formulation of school projects as instruments of learning, in which the education centers on the process and not only on results. It is also different from the studies that center on the materials analysis, from the aspects of messages construction, or from diabetes, hypertension or the metabolic syndrome information<sup>31-32</sup> it is not from food components that make them functional with nutrition and biology, not only to identify calories and nutriment.

The teachers of the analyzed schools are conscious of the need of a program directed to the nourishment that considers the traditional food and the revaluation of consumption patterns about traditional food:

— I believe that a more detailed program on nourishment and nutrition would be very good for the primary schools to lower the indexes of obesity that exists in the state of Tabasco (teacher of sixth degree).

— A very interesting thing I believe is very important to know is the book in which says about the nutrition that our parents were taking and how the change in nourishment affected us (fifth grade teacher).

There is a pending task in the schools to promote education for healthy nutrition, both in basic levels and in universities. It is not possible to teach how to eat healthy if the messages of the obese industry of food and drinks are reproduced in the schools. This research about the context in which the school breakfasts are prepared shows an opportunity area for the practice's reconfiguration that are made in the scholar space, as well as for the boarding plans and programs of contents and class activities. The results of the research demonstrate the need of material production with recommendations based on the scientific findings about food, the design of educational training offers for teachers in order that these could be given to facilitators to the construction of real life learning<sup>11,33</sup>. They also imply the need of more research work to identify culinary preparations, especially of traditional kitchens, which are related to metabolic healthy profiles.

### *Limitations*

The study only considers a limited quantity of all the

schools of the state of Tabasco. Though, even in the possibility that one of them could have been done of major extent because of being a study case is not possible that the information is probabilistic or extrapolated. The study doesn't consider evaluating the impact of the educational content based in exceeded theories related to the nutritional equivalents.

## Conclusions

It was found that the minimal conditions for the development of scholar integration projects exist in more than half of the schools as much as in real life activity contents, as the selection of the food to prepare meals; however they are necessary to design scholar activities for strategic learning, training teachers in the school projects development, as well as including educational materials about nutrition but with a major sustained in scientific evidence about food, at the same time as the plates of the traditional kitchen knowledge are reconsidered.

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