Research article

Current State of Food and Agriculture Education (*SHOKUNOU KYOUIKU*) in Japan

HIROKI INAIZUMI
Faculty of International Food Studies, Tokyo University of Agriculture, Japan
Email:inaizumi@nodai.ac.jp

Received 14 December 2010 Accepted 31 January 2011

Abstract At the beginning of this century, the Japanese education system and associated curriculum dramatically changed, particularly concerning instruction related to acquiring a "Zest for Living" through food and agriculture education. Concomitant with these revisions, numerous studies and activities have been conducted predominantly at the elementary level, with only a few performed at the university level. In attempt to counter this trend, the Tokyo University of Agriculture (TUA) established the Food and Agriculture Education Theory Course (FAETC) in April 2007. In the present study, the effectiveness of the FAETC was investigated by examining the relationship among students' daily lifestyles, particularly nightly sleeping time and breakfast consumption custom, and their academic performance in this course. From the results of surveys conducted over a three-year period, it was revealed that students who had a regular lifestyle with respect to sleeping and eating trends exhibited superior academic performance. However, it appeared that students with an irregular lifestyle also improved their concentration levels. Therefore, these results suggest that a positive correlation exists between lifestyle and concentration level, and student conscientization can be promoted by continuous encouragement in regular class. In other words, it is concluded that a large possibility exists for the role of FAETC for conscientization by students in their daily lives.

Keywords food and agriculture education, food and nutrition education, zest for living, conscientization

INTRODUCTION

Since the Basic Law on *Shokuiku* (Food and Nutrition Education) was enforced on July 2005, numerous activities have emerged, including seminars, publications, and a certifying examination for *Shokuiku*/*Shokunou* (Food and Agriculture) Education, among others. The rapid expansion of this program has been termed the '*Shokuiku* bubble' in Japan.

Along with this trend, the Tokyo University of Agriculture (TUA) has begun '*Shokunou Kyouiku*' (Food and Agriculture Education Theory Course [FAETC]) in the Department of International Bio-Business Studies, Faculty of International Food Studies from April 2007.

Background of the FAETC

According to the preamble of the Basic Law on *Shokuiku*, the Japanese Government clearly stated the importance of *Shokuiku* as follows:

"Above all else 'SHOKU' (food/diet/eating) is important for children to cultivate rich humanity (i.e., develop into well-rounded and compassionate individuals), and to acquire the knowledge and means to live healthy lives. The Basic Law on Shokuiku formally makes Shokuiku the foundation for living, and positions it as the base of intellectual (Chiiku), moral (Tokuiku) and physical (Taiiku) education."

Three years before the Basic Law on Shokuiku enforcement, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) revised the National Curriculum

Standard (NCS) in 2002 by introducing the brand new subject 'Period for Integrated Study', which was aimed at the ability of students to acquire a 'Zest for Living'. Subsequently, many people thought *Shokuiku* and/or other food and agriculture studies were the key contents of the 'Period for Integrated Study' subject. Since foods are a prerequisite condition for every human being, this subject would be a strong learning assistant tool if it contained suitable educational content that was presented properly. In other words, it appeared that *Shokuiku* had significant potential to allow the acquisition of not only knowledge, but also mental and physical skills through individual learning activities.

Theoretical framework

After revising the NCS and enforcing the Basic Law, numerous studies focused on the importance of *Shokuiku* and/or food and agriculture education have been published in Japan. For example, Kageyama (2006) concluded that breakfast behavior and varietal food intake are closely related to academic performance in elementary school students, while Koshikawa et al. (2007) also described a close relationship between diet and learning attitude/motivation. Moreover, Suzuki et al. (2007) and Asaoka et al. (2010) pointed out that food and agriculture education has important functions for rebuilding human relations and revitalizing communication among local communities. However, most studies to date have focused on younger children or have presented complicated theoretical arguments without clear conclusions. For studies involving children, it make sense that eating habits are closely related to children's daily life, but those children cannot be considered independent, as their behaviors are strongly affected by their parents and/or surrounding adults.

Moreover, in addition to dietary habits, academic performance may also be influenced by household conditions (e.g. family structure, income levels, family norm, etc.). Therefore, it appears difficult to evaluate direct relationships between eating habits and academic scores in children. For those studies involving complex theoretical arguments, although the authors collected large amounts of historical and current evidences on food and agriculture education/activities and have put forth important efforts, a concrete theory has yet to be demonstrated.

Therefore, in the present study, an attempt has been made to establish another framework for food and agriculture education and student performance. Specifically, an empirical study involving university students was conducted for evaluating the educational effects of the FAETC in TUA. University students were selected as they are generally considered more independent than primary and secondary school students, which would allow the relations between their eating habits, autonomous behavior (derived from their own conscientization), and academic performance to be captured, and also fill the gaps of previous studies on food and agriculture education in Japan.

Research objectives

The main objective of this study was to evaluate the hypothesis that FAETC has a positive effect for achieving conscientization in students' daily lives and the integration of knowledge, which is typically presented incoherently during early stages of their education.

In general terms, the two main objectives of this survey were to: 1) Compare student behavior concerning breakfast consumption and hours of sleep with the guidelines of the Basic Program for *Shokuiku* Promotion (BPSP) set by the Office for Shokuiku Promotion in the Cabinet Office, Government of Japan in 2006, and 2) Evaluate the effects of FAETC on student lifestyle.

The three specific objectives were to: (1) Examine the current situation for breakfast consumption behavior among target students and compare these findings with the latest National average and/or National projection, (2) Identify factors affecting students' breakfast consumption behavior, and (3) Clarify the relation between students' customs and their performance in this course.

RESEARCH METHODOLOGIES

The FAETC

In response to these stated objectives for the Basic Act of *Shokuiku*, TUA established the FAETC for students who have an interest in food, agriculture, and environment. Table 1 shows a course outline of the FAETC in 2009. The purpose of this course was to allow student to discover the educational elements in agricultural activities.

To cover the areas of not only on food, but also more broad areas including agriculture and environment, TUA decided to adopt FAETC (*Shokunou Kyouiku*) and not Food and Nutrition Education (*Shokuiku*), even though the Basic Law is named *Shokuiku*. For achieving the outlined goals, several discussion sessions were offered as part of the course in addition to the normal lectures.

Table 1 Course content of the FAETC in 2009

Theme of lecture	Topics
1. Background of the birth of *Shokuiku*/ *Shokunoukyouiku*, and current situation	● Current situation of food and agriculture in Japan ● Background of *Shokuiku*/ *Shokunoukyouiku*
2. Education	● What is education? ● Examining educational history
3. History of education and agricultural education in Japan	● Pre-modern age ● Establishment and expansion of the school system ● Agricultural panic and the birth of farmer training centers ● Reformation after WWII ● Current situation
4. Food, agriculture and education	● Lessons learned from general educational theories ● Industrial education besides agriculture
Conclusion	Examining the educational factor in agriculture, introducing the theory of comparison

Source: Web-syllabus of TUA (2009)

Survey methods

To identify the factors affecting students' lifestyle habits, particularly the daily hours of sleep and breakfast consumption, data was collected from FAETC students over a three-year period.

Table 2 Background of participating students

		2007 (total=234)		2008 (total=215)		2009 (total=223)	
		Number	%	Number	%	Number	%
Participants (per total students)		111	47%	63	29%	70	31%
Gender	Male	55	50%	42	67%	46	66%
	Female	56	50%	21	33%	24	34%
Resident	Domestic	94	85%	52	83%	65	93%
	International	17	15%	11	17%	5	7%
Breakfast (total number)	Yes	649	68%	524	81%	543	73%
	No	308	32%	126	19%	198	27%
Course performance (max=10)	Average	7.32		7.29		7.14	
	SD	1.76		2.00		1.54	

To collect data, a survey was conducted by administering a small questionnaire at the end of each FAETC lecture between 2007 and 2009. The four-question questionnaire was distributed 15 minutes before the end of each lecture, filled out by students, and collected; typically, feedback would be given at the beginning of next lecture. Moreover, students were asked each time for their consent concerning the use of their personal information for research. If a student was not willing for their information to be utilized for research purposes, that data was eliminated from the analysis. The course performance was combined final examination and homework scores into 0 to 10 scales. The composition of students who participated in the survey is summarized in Table 2.

SURVEY RESULTS

Investigation of student background and their lifestyle with a focus on the daily hours of sleep and breakfast consumption

There are three majors (Management, Information, and Environment Sciences) in the Department of International Bio-Business Studies at TUA which offer specific lectures and seminars for each selected major. FAETC is one of the compulsory lecture courses in the Environment Major; therefore, the number of participating students varies each year. Table 2 indicates the number of participating students and their characteristics for each year during 2007-2009, as mentioned above.

As shown in the first column of Table 2, the total number of students in the department by academic year was: 234 in 2007, 215 in 2008, and 223 in 2009. Of these, the number and portion of participating students for FAETC was: 111 (47%) in 2007, 63 (29%) in 2008, and 70 (31%) in 2009, while the gender ratio (male: female) of participants was close to 7:3, with the exception of 2007, when the ratio was 5:5. The portion of domestic and international students was 85:15 in 2007, 83:17 in 2008, and 93:7 in 2009.

After compiling the collected student data related to lifestyle (Table 3), it was compared to the target figures of the BPSP.

Table 3 Average nightly sleeping hours and breakfast consumption

	2007		2008		2009		3-year average	
	Average	SD	Average	SD	Average	SD	Average	SD
Hours of sleep	5.92	1.492	5.98	1.569	5.91	1.552	5.93	1.532
Breakfast consumption (%)	67.80	0.467	80.60	0.396	73.30	0.443	73.10	0.444

Table 3 shows that in the initial year that FAETC was offered (2007), the average breakfast consumption rate was 67.8%, which was significantly below the national average of 73.5% reported by the BPSP in 2006. However, the three-year average consumption rate by students in this course (73.1%) was similar to national average reported by the BPSP and slightly higher than the value (71.9%) reported in the National Health and Nutrition Survey (NHNS) conducted by the Ministry of Health, Labour and Welfare in 2009. Although a peak breakfast consumption rate of 80.6% was observed in 2008, it appears that the BPSP target figure of 85% in 2011 may be difficult to achieve.

With respect to the reported hours of sleep, the three-year average of FAETC students was 5.93 hours per day, which was close to the national average reported in the NHNS of 6-7 hours per day.

Factors influencing breakfast consumption

Among the factors evaluated in this survey, several were selected to examine their correlation with breakfast consumption behavior (Table 4).

Table 4 Correlation of selected factors with breakfast consumption

		Correlation coefficient	Significance level	F value	Cases
Gender	(male=1)	-0.10	0.000	138.61	2348
Student	(international=1)	-0.06	0.000	33.86	2348
Sleeping time	(hours)	0.01	0.233	1.43	2348
Academic year	(2007-2009)	0.06	0.000	24.73	2348

According to Table 4, a positive correlation with breakfast consumption behavior was only shown for 'academic year', while negative correlations were detected for both 'gender' and 'student' background (Japanese-International [Intl.]). As the student breakfast consumption behavior gradually improved from 2007 to 2009, it suggests that breakfast consumption was affected by the series of educational activities promoted under the current '*Shokuiku* bubble' as *Shokuiku* and/or *Shokunou* became popularized in society, and might also be good evidence for the efficacy of the National Campaign for BPSP. The factor of 'male student' showed a negative correlation with breakfast consumption behavior, indicating that female students have a higher tendency to consumption breakfast than their male counterparts. Intl. students also had a negative correlation with breakfast consumption rate, suggesting that their behavior may have been affected by the additional cost of breakfast. The last examined factor, 'sleeping time', was positively, but not significantly, correlated with breakfast consumption behavior of the student participants.

Comparison of the hours of sleep between breakfast consumers and non-consumers

A comparison between breakfast consumers (hereafter 'bf-consumers') and non-breakfast consumers (hereafter 'bf-non-consumers') in connection with average sleeping hours by FAETC lecture number (Figures 1, 2) revealed a more stable trend in bf-consumers than bf-non-consumers. Although it is possible that bf-consumers had already established independent life routines and actions (autonomous behavior), no significant correlation existed between breakfast consumption behavior and hours of sleep against which the general public perceive.

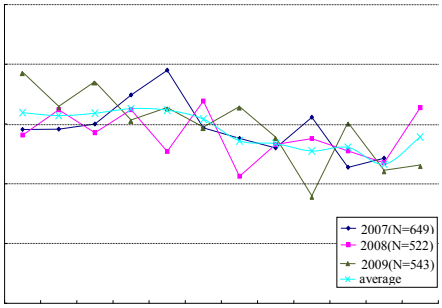

Fig. 1 Breakfast consumer's average sleeping hours by lecture number

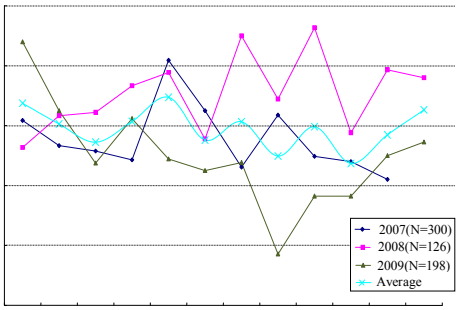

Fig. 2 Breakfast non-consumer's average sleeping hours by lecture number

Correlation between breakfast consumption behavior and academic course performance

As shown in Table 5, female students displayed good performance in the course, and course performance also had a positive correlation with breakfast consumption behavior. Even though the significance level was not high, a definite positive correlation between breakfast consumption behavior and FAETC performance was identified. This result displayed a similar trend with several studies that have also identified a close connection between these two factors in younger children.

Table 5 Correlation of gender and breakfast consumption with course performance

		Correlation coefficient	Significance level	F value	Cases
Gender	(male=1)	-0.16	0.204	7.711	2385
Breakfast	(consumption=1)	0.09	0.030	-4.616	2348

DISCUSSION

In this study, several factors affecting student lifestyle habits, particularly the hours of daily sleep and consume of breakfast, and the correlation of their lifestyles with FAETC performance were examined.

The present results confirmed that a positive correlation exists between breakfast behavior and course performance, which is similar to the findings of previous studies conducted at the elementary level. However, a clear difference among the two student groups was detected in terms of conscientization level. Although nearly all elementary students heavily rely on their parents for their life activities, many university students, particularly at the junior level, are more independent and in the process of establishing their own lifestyle. During this period, it could be quite useful to urge students to acquire awareness of their daily activities, not only those related to learning, but also more ordinal ones, such as part time working, reading a book and taking an exercise. For example, a clear difference in the trend of sleeping-hours was identified between bf-consumers who advanced establishment on an independent lifestyle and bf-non-consumers. Thus, it could be stated that the FAETC is an effective method to acquire a sense of conscientization.

Even before participating in FAETC, it was expected that the student participants would possess a good attitude towards breakfast consumption behavior. However, the results revealed that the difference between the student rates of breakfast consumption did not significantly differ from the National Average. This was also the case for the daily hours of sleep. From these results, it is apparent that even for the students who have an interest in food, a well-organized approach is required to improve their attitude towards healthy lifestyle choices.

It can be conclude that there is a need to offer FAETC for the early-twenties generation because this group faces the most negative nutritional condition in Japan. Although improvements to FAETC may be warranted, this course has the potential to positively change students' lifestyle choices, such as breakfast consumption behavior, and improves total performance, even with its current curriculum and methods are justified and numbered consecutively, with equation numbers in parentheses flush right, as in Eq. (1). First use the equation editor to create the equation. A sample equation is included here, formatted using the preceding instructions.

CONCLUSION

Students who have a regular lifestyle with respect to sleeping and eating habits tend to exhibit good academic performance. In addition, those students who improved their lifestyle also displayed increased concentration levels. From the results presented here, it was demonstrated that a correlation exists between lifestyle and concentration level, and that conscientization can be promoted by continuous encouragement in regular class. In other words, it is considered that a large possibility exists for the role of FAETC in conscientization by students in their daily lives.

Even though improvements to the current FAETC curriculum may be warranted, for example, evaluating the appropriateness of the stated objectives and addressing the confusion felt by some students between current *Shokunou Kyouiku* activities and the historical evidences from general education, the data presented here may help to establish more comprehensive and suitable *Shokunou Kyouiku* in the future through active discussions in academic societies and individuals who have an interest in this topic conclusion might elaborate on the importance of the work or suggest applications and extensions. Do not cite references in the conclusion as all points should have been made in the body of the paper. Note that the conclusion section is the last section of the paper to be numbered.

REFERENCES

Asaoka, Y. and Nomura, T. (2010) The Power of shokuiku. Kouseikan, Japan (in Japanese).

Basic Law on Shokuiku (2005) http://www8.cao.go.jp/syokuiku/about/law/law.html#zen.

Cabinet Office (2006) The basic program for shokuiku promotion (BPSP). http://www8.cao.go.jp/syokuiku/about/plan/pdf/kihonkeikaku.pdf (in Japanese).

Kageyama, H. (2006) Fostering children's academic performance by "sleep and wake up early and take breakfast". ShokuikuKatsudou (Activities on Food and Nutrition Education), Rural Culture Association (*NOBUNKYOU)*, 3, 36-39 (in Japanese).

Koshikawa, E., Okuda, T. and Murai, Y. (2007) The relation of dietary life with learning attitude and motivation in elementary school children. Bulletin of Osaka Kyouiku University, Section II, 55-2, 35-44 (in Japanese).

Ministry of Health, Labour and Welfare (2009) The national health and nutrition survey (NHNS). http://www.mhlw.go.jp/houdou/2009/11/dl/h1109-1b.pdf (in Japanese).

NOBUNKYOU (1998) Shokunou Kyouiku (Food and Agric. Education). 1, 152 (In Japanese).

Suzuki, Z., Asaoka, Y., Kikuchi, Y. and Nomura, T. (2007) Regeneration of education by Shokunou. NOBUNKYOU (in Japanese).

Web-syllabus of TUA (2010) http://sv1.all-campus.net/scl2/APM2P0201A.html?UPRM=tua (in Japanese).