

Jeng-Hwan Wang¹
A STUDY ON KEY PERFORMANCE INDICATOR
FOR FOOD SERVICE BUSINESSES
IN TAIWAN

Discussing key performance indicator (KPI) for the food service businesses in Taiwan, this study establishes a suitable quantitative evaluation for sustainable management of businesses. With literature review and modified Delphi method, consistent KPIs for the operation in food service industry are selected; and then, 4 dimensions in hierarchy II and the questionnaire with 13 evaluation criteria in hierarchy III are established with analytic hierarchy process (AHP). The supervisors of food service businesses, evaluation committee of HACCP, experts and consumers (school lunch undertakers and employees in enterprises) are surveyed via formal questionnaire. Within 485 copies being distributed, total 427 valid copies are collected. With AHP to analyze the consistency and compare the data differences, the key dimensions in hierarchy II are sequenced: implementation of safety and hygiene management, staff performance and quality responsibility, business experience and the overall image, and software, hardware, and logistic support, and the top 5 criteria in hierarchy III are: management of food material and additive sources, practice of employees following the operation standards in workplaces, implementation of operation standards for production equipment and production line, carrying out contract as scheduled, and ability of dieticians allocating dishes and developing new products. An evaluation scale for rationalization and effectiveness of performance in food service industry is proposed for the sustainable operation of businesses and the selection of food service businesses for consumers.

Keywords: food service industry, modified Delphi method, analytic hierarchy process, key performance indicator, HACCP.

Жен-Хуань Ванг
ДОСЛІДЖЕННЯ КЛЮЧОВИХ ПОКАЗНИКІВ
ЕФЕКТИВНОСТІ ДІЯЛЬНОСТІ ПІДПРИЄМСТВ
ГРОМАДСЬКОГО ХАРЧУВАННЯ НА ТАЙВАНІ

У статті досліджено ключові показники ефективності (КПЕ) підприємств громадського харчування на Тайвані, визначено критерії кількісного оцінювання стійкого управління бізнесом. На базі існуючих досліджень і за допомогою модифікованого методу Дельфі встановлено КПЕ для громадського харчування, 4 виміри і 13 критеріїв оцінювання встановлено за допомогою аналізу ієрархій. Опитано керівників підприємств громадського харчування, експертів HACCP і споживачів. Ключові аспекти в одній з ієрархій аналізу – контроль безпеки і гігієни, якість роботи персоналу і відповідальність за якість, бізнес-досвід і загальний імідж підприємства, програмне забезпечення, апаратні засоби і логістичне забезпечення. Топ-5 критеріїв у наступній ієрархії – управління якістю сировини, практика співробітників по дотриманню стандартів роботи, впровадження стандартів роботи для виробничого устаткування і виробничих ліній, виконання зобов'язань по контрактах, розробка дієт і введення нових продуктів. Запропоновано шкалу оцінювання раціоналізації і ефективності діяльності на підприємствах громадського харчування для стійкого функціонування підприємства і вибору компаній громадського харчування для споживачів.

Ключові слова: підприємства громадського харчування, модифікований метод Дельфі, аналіз ієрархій, ключові показники ефективності, аналіз ризиків і критичні контрольні точки.

Табл. 4. Літ. 30.

¹ PhD (Food Science), Assistant Professor, Department of Food and Beverage Management, Mackay Medicine, Nursing and Management College in Taipei City, Taiwan.

Жэн-Хуань Ванг
**ИССЛЕДОВАНИЕ КЛЮЧЕВЫХ ПОКАЗАТЕЛЕЙ
ЭФФЕКТИВНОСТИ ДЕЯТЕЛЬНОСТИ ПРЕДПРИЯТИЙ
ОБЩЕСТВЕННОГО ПИТАНИЯ НА ТАЙВАНЕ**

В статье исследуются ключевые показатели эффективности (КПЭ) предприятий общественного питания на Тайване, определены критерии количественной оценки устойчивого управления бизнесом. На базе существующих исследований и с помощью модифицированного метода Дельфи установлены КПЭ для общественного питания, 4 измерения и 13 критериев оценки установлены с помощью анализа иерархий. Опрошены руководители предприятий общественного питания, эксперты НАССР и потребители. Ключевые аспекты в одной из иерархий анализа – контроль безопасности и гигиены, качество работы персонала и ответственность за качество, бизнес-опыт и общий имидж предприятия, программное обеспечение, аппаратные средства и логистическое обеспечение. Топ-5 критериев в следующей иерархии – управление качеством сырья, практика сотрудников по соблюдению стандартов работы, внедрение стандартов работы для производственного оборудования и производственных линий, выполнение обязательств по контрактам, разработка диет и введение новых продуктов. Предложена шкала оценки рационализации и эффективности деятельности на предприятиях общественного питания для устойчивого функционирования предприятия и выбора компаний общественного питания для потребителей.

Ключевые слова: предприятия общественного питания, модифицированный метод Дельфи, анализ иерархий, ключевые показатели эффективности, анализ рисков и критические контрольные точки.

I. Introduction. With the impact of globalization and climate change, the increasing food materials, raw materials, and energy costs have resulted in the inflation of prices. Consumer price index (CPI) has risen from 96.08 in 2001 (2006 = 100) to about 110 in 2012; particularly, food appears to be the most significant inflation. Consumer price index is rising every year in the past decade (Directorate-General of Budget, Accounting and Statistics, Executive Yuan, 2012). Moreover, employees in food service industry present high labor force that the operation cost is increased with the increasing purchase cost and personnel cost, caused by the increase of minimum wage. To reduce production costs, domestic manufacturing industry moving outward has resulted in the reduction of employee meals. On the other hand, low birth rate has caused the decreasing number of students in each class. Regarding the stagnation of consuming market, the operation environment for food service industry would be affected.

In the face of the fierce competition at the market, key performance indicator (KPI) for the repositioning of food service industry is urgently required for breaking through the bottleneck of present operation and developing new operation for sustainable management. Such indicators are expected to promote the performance of enterprises. Meanwhile, it is expected to provide businesses with reasonably quantitative indicators for enhancing the competitiveness and sustainable management in the industry. By applying modified Delphi method and analytic hierarchy process (AHP), this study tends to discover the evaluation dimensions and criteria in key performance indicator for the operation of food service industry, so as to establish a rational and effective evaluation model as the indicators of performance promotion.

Besides, it would provide businesses with rational quantitative indicators for achieving the objectives of industrial competitiveness and sustainable management when regulating operations.

II. Literature review.

A. Present situation of Food Service Industry in Taiwan and the development bottleneck. Food service refers to group catering services provided by public departments, or food departments in industry, commerce, and social welfare organizations, beyond families, covering industrial factories, commercial groups, public and private educational institutes, hospitals and the branches, social welfare organizations, and public sectors, such as retirement homes for veterans etc. (Wang, 2011).

Hazard analysis critical control point (HACCP), the science-based system, establishes specific hazards and control of people, affairs, time, places, and objects to ensure the safety and hygiene of meals (Fletcher et al., 2009). After the practice of Early Guidance in the Verification of hazard analysis critical control point (HACCP) in 1997 (Wang and Jeng, 2007), it has been developed into large-scale production (providing more than 10000 meals per meal) (Wang, 2011), and food service industry with quality hygiene and safety management becomes the new model of global food service industry (Wang et al., 2010; Wang et al., 2011). Recently, the development of food service industry in Taiwan has encountered 3 bottlenecks. (1) The food service market is shrinking because of the effects of global recession and industrial structure, resulting in manufacturing industry moving outward. (2) The decrease of birth rate affects the school lunch market. (3) International fast-food catering and large-scale food logistics impact domestic industries (Wang, 2009). As a result, 167 businesses with the regulatory assessment of HACCP are selected as the research subject (Department of Health, Executive Yuan, 2012). Food service businesses with HACCP which has presented economic scales are re-evaluated the dimensions and criteria of key performance indicator in order to establish a rational and effective evaluation model for the promotion of performance and the sustainable management of businesses.

B. Key Performance Indicator (KPI). KPI is regarded as a quantitative evaluation tool for measuring the operation performance of industry and monitoring and evaluating the productivity (Robert et al., 2003). Having determined the key indicators, the industry has the financial measures for tracing and predicting the objectives (Wadongo et al., 2010); each indicator could reflect the suitable conditions of the industry to achieve the purpose of sustainable management (Samsonowa et al., 2009). KPI have been applied to the industrial research on building management, hotel and tourism management, franchised restaurants, and industrial technology R&D (Robert et al., 2003; Samsonowa et al., 2009; Wadongo et al., 2010).

C. Modified Delphi Method. Traditional Delphi method tends to acquire the opinions and ideas of experts on the subject with open-ended questionnaire. In consideration of the specific study, the procedure has been modified, where the open-ended questionnaire is deleted but replaced with expert interviews or literature review, to develop a structural questionnaire. Such a modification is named modified Delphi method, aiming to save time and costs and have experts focus on the research subject to increase the retrieval rate of questionnaire (Murry & Hammons, 1995).

D. Analysis of Hierarchy Process (AHP). Analysis of hierarchy process, the multiple attribute decision making developed by Saaty in 1971, could support individual or group decisions. By comparing 2 factors, AHP could acquire the prior measuring theory with statistical analyses. Analysis of hierarchy process is utilized for the formulation of group decision commonly used for finding out the optimal strategies for decision-makers, such as the evaluation and selection of information systems, the selection of tours, resource allocation, and the selection of suppliers in a supply chain (Saaty, 1990). There has not been research on key performance indicator for the food service industry with HACCP verification where the analytic hierarchy process is applied to for the analyses.

III. Research method.

A. Organization of Key Performance Indicator for the operation of Food Service Industry with HACCP in Taiwan. From the tender proposals of food service businesses for school lunch or employee meals at enterprises, the items with high partitions were organized in this study. 38 experts and researchers were further proceeded in-depth interviews for the factors in key performance indicator for the operation of food service industry with HACCP in Taiwan. After interviewing the experts and researchers for 3–4 times, 16 common factors were organized and further classified into: business experience and the overall image; software, hardware, and logistic support; staff performance and quality responsibility; implementation of safety and hygiene management; marketing capability, see Table 1.

Table 1. Key Performance Indicator for the operation of Food Service Industry with HACCP in Taiwan with Modified Delphi Method

Evaluation dimension	Evaluation criteria
Business experience and the overall image	a. Passing the regulatory assessment of HACCP (Being assessed as fine manufacturer by New Taipei City Government or other institutes). b. Supplying more than a thousand meals per day and not having food poisoning in 5 years. c. Not having returned check records.
Software, hardware, and logistic support	a. Instantaneously updating production equipment. b. Optimal production team with the staff receiving complete educational trainings. c. Guarantee of instantaneous food supply by surmounting all difficulties.
Staff performance and quality responsibility	a. Employees with relevant certificates. b. Control of company logistics and favorable fund dispatching. c. Carrying out contract as scheduled. d. Ability of dieticians allocating dishes and developing new products.
Implementation of safety and hygiene management	a. Management of food material and additive sources. b. Practice of employees following the operation standards in workplaces. c. Implementation of operation standards for production equipment and production line.
Marketing capability	a. Applying advertisement to promoting company popularity. b. Segmenting the market into target groups. c. Developing new distribution channels.

B. Questionnaire survey. Total 485 copies of questionnaires were distributed to the manufacturers executives (with the regulatory assessment of HACCP), supervisors (including local health centers, HACCP experts, and on-site auditors), and consumers (containing schools, hospitals, retirement homes for veterans, and employees in industrial parks) in Northern, Central, Southern, and Eastern Taiwan. 427 copies were retrieved, with the retrieval rate of 88%.

IV. Analysis.

A. *Factor Analysis of Key Performance Indicator for the operation.*

1. *Evaluation dimensions in hierarchy II.* CR < 0.1 represented the consistence among the criteria under the samples in two hierarchies, Table 2. Having analyzed the data in the retrieved 427 valid questionnaires with AHP, the 4 dimensions were ranked as implementation of safety and hygiene management, staff performance and quality responsibility, business experience and the overall image, and software, hardware, and logistic support.

2. *Overall evaluation of the evaluation criteria in hierarchy III.* 13 evaluation criteria in hierarchy III were preceded AHP, and the matrix and weight of paired comparisons are shown in Table 2.

(1) *Business experience and the overall image.* 3 evaluation criteria in business experience and the overall image were ranked as passing the regulatory assessment of HACCP, supplying more than 1000 meals per day and not having food poisoning in 5 years, and not having returned check records.

(2) *Staff performance and quality responsibility.* 4 evaluation criteria in staff performance and quality responsibility were ranked as carrying out contract as scheduled, ability of dieticians allocating dishes and developing new products, employees with relevant certificates, and control of company logistics and favorable fund dispatching.

(3) *Software, hardware, and logistic support.* 3 evaluation criteria in software, hardware, and logistic support were ranked as optimal production team with the staff receiving complete educational trainings, guarantee of instantaneous food supply by surmounting all difficulties, and instantaneously updating production equipment.

(4) *Implementation of safety and hygiene management.* 3 evaluation criteria in implementation of safety and hygiene management were ranked practice of employees following operational standards in workplaces, guarantee of instantaneous food supply by surmounting all difficulties, and implementation of operation standards for production equipment and production line.

From the 427 retrieved questionnaires, 13 evaluation criteria in hierarchy III were ranked as management of food material and additive sources, practice of employees following operational standards in a workplace, implementation of operation standards for production equipment and production line, carrying out contract as scheduled, ability of dieticians allocating dishes and developing new products, employees with relevant certificates, passing the regulatory assessment of HACCP (Being assessed as fine manufacturer by New Taipei City Government or other institutes), optimal production team with the staff receiving complete educational trainings, supplying more than 1000 meals per day and not having food poisoning in 5 years, and control of company logistics and favorable fund dispatching.

V. Discussion and suggestion.

A. According to key performance indicator for the operation of food service industry in Taiwan, 3 groups of questionnaire participants are compared the weights of evaluation dimensions in hierarchy II, in Table 2. 2 the evaluation dimensions are proposed for further discussion.

1. *Implementation of safety and hygiene management.* This evaluation dimension is ranked on the top in the 3 groups of questionnaire participants that a complete oper-

Table 2. Analyses of overall evaluation criteria

Evaluation dimensions in hierarchy II	Hierarchic weight*	Evaluation criteria in hierarchy III	Hierarchic weight	Overall weight*	Ranking
Business experience and the overall image	0.165 ^c	Passing the regulatory assessment of HACCP (Being assessed as fine manufacturer by New Taipei City Government or other institutes)	0.417	0.069 ^f	6
		Supplying more than 1000 meals per day and not having food poisoning in 5 years	0.398	0.065 ^f	6
		Not having returned check records	0.185	0.031 ⁱ	13
Staff performance and quality responsibility	0.294 ^b	.jmax = 3.024 CI = 0.012 CR = 0.021			
		Employees with relevant certificates	0.238	0.07 ^f	6
		Control of company logistics and favorable fund dispatching	0.223	0.065 ^f	6
		Carrying out contract as scheduled	0.288	0.085 ^d	4
Software, hardware, and logistic support	0.149 ^l	Ability of dieticians allocating dishes and developing new products	0.251	0.074 ^e	5
		.jmax = 4.025; CI = 0.008; CR = 0.009			
		Instantaneously updating production equipment	0.22	0.033 ^h	12
Implementation of safety and hygiene management	0.392 ^a	Optimal production team with the staff receiving complete educational trainings	0.445	0.066 ^f	6
		Guarantee of instantaneous food supply by surmounting all difficulties	0.335	0.05 ^g	11
Implementation of safety and hygiene management	0.392 ^a	.jmax = 3.003; CI = 0.001; CR = 0.002			
		Management of food material and additive sources	0.394	0.154 ^a	1
		Practice of employees following operational standards in workplaces	0.341	0.134 ^b	2
Implementation of operational standards for production equipment and production line			0.265	0.104 ^c	3
			.jmax = 3.008; CI = 0.004; CR = 0.007		
			CRH = 0.034		

* Different letters show the significant differences between the data (p < 0.05).

ation procedure is required for the safety of food materials and additives, the hygiene of factories and products, the hygiene management of food production, and the control of food sources. Consequently, implementation of safety and hygiene management is critical for the operation of food service industry (Eves and Dervisi, 2005; Bata et al., 2006; Rodgers, 2005; Taylor, 2008).

2. Staff performance and quality responsibility. The dimension is ranked second in the 3 groups of questionnaire participants, presenting the HACCP system emphasizing the management of sources, autonomic management, and product guarantees in food service industry that staff performance and quality responsibility is primary for the operations of food service industry (Wang et al., 2010; Wang et al., 2011).

B. For key performance indicator for the operation of food service industry in Taiwan, the ranking of evaluation criteria in hierarchy III among the 3 groups of questionnaire participants shows consistence on multiple evaluation criteria or remarkable differences which are further discussed.

1. Practice of employees following the operational standards at a workplace and implementation of operational standards for production equipment and production line. The 2 criteria are ranked top in the 3 groups of questionnaire participants possibly because businesses in a well-managed company would be formulated as proper procedure and management measures. After the practice of HACCP in food service industry in Taiwan, the operational standards for the production line and employees would be explained in ISO documents. Once the SOP documents are established, the daily work would not be stopped because of turnover and the food hygiene and safety problems would be effectively avoided (Baker, 1999; Shields, 2006).

2. Not having returned check records. As large-scale food service industry presents large amount of cash turnover, financial stability is essential for the favorable image of a company. Such a result is similar to the research of Estes et al. (2011) that abundant case turnover could enhance operations of a company. It is found that not having returned check records reveals lower ranking in the 3 groups of questionnaire participants possibly because consumers and food service businesses pay more attention to final products; besides, the bills are affected by business cycle and financial crisis.

3. Instantaneously updating production equipment. To successfully operate catering industry, the requirements for production equipment and the distribution and planning of kitchen are important (Sony, 2003). This study discovers that instantaneously updating production equipment shows lower ranking in the 3 groups of questionnaire participants possibly because the hardware equipment of food service has achieved certain standards after the introduction of HACCP into food service industry in Taiwan.

4. Management of food material and additive sources. This criterion is ranked on the top in manufacturers and consumers, but the sixth for supervisors, possibly because hazard analysis critical control point and ISO22000 require a traceable system to trace efficiently individual product allocation and logistics units from production to consumers. According to the international agriculture product control, the practice and verification of good agriculture practice (GAP) and the establishment of food traceability system present consistence with the research outcomes (Choe et al., 2009; Dabbene & Gay, 2006; Folinis et al., 2006). Nevertheless, supervisors accept

food materials and additives being within the legal usage range that the ranking of this criterion is relatively lower.

5. *Carrying out contract as scheduled.* This criterion is ranked on the top by supervisors, the fourth by consumers, and the sixth by manufacturers possibly because manufacturers in the food service industry are likely to encounter irresistible variables, such as natural disasters and suspension of water and electricity supply, while consumers emphasize the supplement of meals. From the aspect of food supervision, supervisors consider the performance of contract as scheduled being the completion of individual duty that the criterion is regarded as the most critical, and contract theory carrying out contract as scheduled is the key factor in stable operations of a company. Such results are consistent with the research outcomes in (Seshadri & Mishra, 2004).

Table 3. Ranking of evaluation criteria in hierarchy III in 3 groups of questionnaire participants among key performance indicator for the operation of food service industry with HACCP in Taiwan

Evaluation criteria in hierarchy III	Overall	Consumers	Manufacturers	Supervisors
Passing the regulatory assessment of HACCP (Being assessed as fine manufacturer by New Taipei City Government or other institutes)	6	6	8	10
Supplying more than 1000 meals per day and not having food poisoning in 5 years	6	10	6	6
Not having returned check records	13	12	13	12
Employees with relevant certificates	6	7	4	6
Control of company logistics and favorable fund dispatching	6	7	10	4
Carrying out contract as scheduled	4	4	6	1
Ability of dieticians allocating dishes and developing new products	5	5	9	4
Instantaneously updating production equipment	12	13	12	13
Optimal production team with the staff receiving complete educational trainings	6	9	4	11
Guarantee of instantaneous food supply by surmounting all difficulties	11	11	11	6
Management of food material and additive sources	1	1	1	6
Practice of employees following the operation standards in workplaces	2	2	1	1
Implementation of operation standards for production equipment and production line	3	3	2	1

6. *Employees with relevant certificates.* A complete verification system could ensure professional standards and operation qualification of employees as well as assist in establishing correct career conception and promoting service quality (Chen, 2010; Hunsinger et al., 2009; Goetz et al., 2011; Wang et al., 2011). This criterion is ranked the seventh by consumers, the fourth by manufacturers, and the sixth by supervisors possibly because manufacturers consider professional certificates of employees being the basic threshold in food service industry. Certificates could present professional skills of employees, but not their personality traits. However, consumers and supervisors stress the personality traits of strong work ethics and career ethics.

7. *Control of company logistics and favorable fund dispatching.* Complete logistics management and successful logistics strategies could enhance the market share of an enterprise (Myers et al., 1996; Autry et al., 2008). This criterion is ranked the seventh by consumers, the tenth by manufacturers, and the fourth by supervisors. Possible reasons are listed below.

(1) Supervisors are expected to complete the supply and demand between manufacturers and consumers. According to Jensen's free cash flow theory, fund dispatching of a company, such as the control of capital, the reduction of costs, and promotion of profits, are extremely important (Liu, 2010; Farrell, 2003; Forbes, 2007).

(2) With the simple capital sources under the financial policy in Taiwan, the managing regions of food service businesses are not large, with convenient transportation and abundant food material sources, the criterion is ranked lower by consumers and manufacturers.

C. Research contribution and suggestions. Basing on the research outcomes, key performance indicator for the operation of food service industry in Taiwan are proposed, Table 4, for the sustainable management of businesses and the selection of excellent food service business for consumers.

Table 4. Evaluation of Key Performance Indicators for Food Service Industry in Taiwan

Evaluation Dimension	Partition	Evaluation criteria in hierarchy III	Partition	Self-evaluation of Food Service Businesses
Business experience and the overall image	165	Passing the regulatory assessment of HACCP (Being assessed as fine manufacturer by New Taipei City Government or other institutes)	69	
		Supplying more than 1000 meals per day and not having food poisoning in 5 years	65	
		Not having returned check records	31	
Staff performance and quality responsibility	294	Employees with relevant certificates	70	
		Control of company logistics and favorable fund dispatching	65	
		Carrying out contract as scheduled	85	
Software, hardware, and logistic support	149	Ability of dieticians allocating dishes and developing new products	74	
		Instantaneously updating production equipment	33	
		Optimal production team with the staff receiving complete educational trainings	66	
Implementation of safety and hygiene management	392	Guarantee of instantaneous food supply by surmounting all difficulties	50	
		Management of food material and additive sources	154	
		Practice of employees following the operational standards at workplaces	134	
		Implementation of operational standards for production equipment and production line	104	

Acknowledgements. I thank Dr. Fu-Jin Wang for his constructive comments. I also thank Sin-Yi Tsai, Jin-Hao Tsai, Tzu-Hsiung Hung, Jui-Lin Weng and Geng-Cheng Niu for their efforts in the survey.

Reference:

- Autry, C.W., Zacharia, Z.G., Lamb, C.W. (2008). Logistics strategy taxonomy. *Journal of Business Logistics*, 29(2): 27–51.
- Baker, H. (1999). Standard operating procedures. *Global Cosmetic Industry*, 165(2): 40–41.
- Bata, D., Drosinos, E.H., Athanasopoulos, P., Spathis, P. (2006). Cost of GHP improvement and HACCP adoption of an airline catering company. *Food Control*, 17: 414–419.
- Chen, P. (2010). The effects of financial license on job performance. *Journal of Global Business Management*, 6(2): 1–5.
- Choe, Y.C., Park, J., Chung, M. (2009). Effect of the food traceability system for building trust: price premium and buying behavior. Springer Science, 11: 167–179.
- Dabbene, F., Gay, P. (2006). Food traceability systems: performance evaluation and optimization. *Computers and Electronics in Agriculture*, 75: 139–146.
- Estes, J., Richard, S.S. (2011). A comparison of financial analysis software for use in financial planning for small businesses. *Journal of Financial Service Professionals*, 3: 48–55.
- Eves, A., Dervisi, D. (2005). Experiences of the implementation and operation of hazard analysis critical control points in the food service sector. *Hospitality Management*, 24: 3–19.
- Farrell, L.M. (2003). Principal-agency risk in project finance. *International Journal of Project Management*, 21: 547–561.
- Fletcher, S.M., Maharaj, S.R., James, K. (2009). Description of the food safety system in hotels and how it compares with HACCP standards. *Journal of Travel Medicine*, 16(1): 35–41.
- Folinas, D., Manikas, I., Manos, B. (2006). Traceability data management for food chains. *British Food Journal*, 108(8): 622–633.
- Forbes, K.J. (2007). One cost of the Chilean capital controls: increased financial constraints for smaller traded firms. *Journal of International Economics*, 71: 294–323.
- Goetz, J.W., Zhu, D., Hampton, V.L., Chatterjee, S., Salter, J. (2011). Integration of professional certification examinations with the financial planning curriculum: Increasing efficiency, motivation, and professional success. *American Journal of Business Education*, 4(3): 35–46.
- Hunsinger, D., Smith, M. (2009). IT certification use by hiring personnel. *Journal of Computer Information Systems*, 50(2): 71–82.
- Liu, Z. (2010). Strategic financial management in small and medium-sized enterprises. *International Journal of Business and Management*, 5(2): 132–136.
- Murry, J.W., Hammons, J.O. (1995). Delphi: a versatile methodology for conducting qualitative research. *Review Higher Education*, 18(4): 423–436.
- Myers, M.B., Fawcett, S.E. (1996). Operating in the Caribbean: a logistics perspective. *International Journal of Physical Distribution and Logistics Management*, 26(9): 20–35.
- Robert, F.C., Raja R.A., Issa, M.A., Ahrens, D. (2003). Management's perception of key performance indicators for construction. *Journal of Construction Engineering and Management*, 129(2): 142–151.
- Rodgers, S. (2005). Food safety research underpinning food service systems – a review. *Food Service Technology*, 5: 67–76.
- Saaty, T.L. (1990). *The Analytic Hierarchy Process*. Pittsburgh, PA: RWS Publications.
- Samsonowa, T., Buxmann, P., Gerteis, W. (2009). Defining KPI sets for industrial research organizations – A performance measurement approach. *International Journal of Innovation Management*, 13(2): 157–176.
- Seshadri, S., Mishra, R. (2004). Relationship marketing and contract theory. *Industrial Marketing Management*, 33: 513–526.
- Shields, J. (2006). Restaurant revenue management: an investigation into changing standard operating procedures to maximize revenue. *Journal of Small Business Strategy*, 17(1): 77–85.
- Sony, B. (2003). *Successful Catering: Managing the Catering Operation for Maximum Profit*. Ocala, Florida: Atlantic Publishing Group.
- Taylor, E. (2008). A new method of HACCP for the catering and food service industry. *Food Control*, 19: 126–134.
- Wadongo, B., Odhuno, E., Kambona, O., Othunon, L. (2010). Key performance indicators in the Kenyan hospitality industry: a managerial perspective. *Benchmarking: an International Journal*, 17(6): 858–875.

Wang F.-J., Jeng, T.-S. (2007). HACCP Theory and Practice, 124–139. Xing Wun-Ching Publishing Group, Inc.: Taipei, Taiwan.

Wang, F.-J. (2011). Key success factors in optimal operation and management for large-scale group diet industry – a study on Foxconn technology group central kitchen. *Actual Problems of Economics*, 122(8): 358–368.

Wang, F.-J., Hung, C.-J., Li, Patrick, P.-Y. (2011). The indispensable chef competency appraisal of HACCP certified contract food service companies in Taiwan. *Pakistan Journal of Statistics*, 27(5): 645–654.

Wang, F.-J., Hung, M.-W., Yeh, S.-P. (2010). Research on health administrators' core competency of HACCP-certificated catering suppliers in Taiwan – case on the school lunch operation. *Actual Problems of Economics*, 2(12): 125–134.

Стаття надійшла до редакції 5.11.2012.