

Factors affecting Storage of Food Materials: A Study of Small Hotels in India

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ABSTARCT - **Purpose** – The empirical study intends to unearth various factors that affect storage of food materials in sampled hotels of India. This shall provide a deep look into the practices of one of the fastest growing industry of the Indian economy.

Design/Methodology/Approach – A 5 point Likert type scale ranging from *Not Important at all* to *Very Important*; where the earlier stands for least and later denotes the highest importance. The persons responsible for purchasing and storing food materials were respondents for the study.

Findings – The store officials in sampled hotels were found to most concerned about problems related to pests, hygiene & sanitation, shortage of inventory, and damage due to pests, as this amount in unnecessary losses to the organisations.

Research limitations – Though, the findings shall be very helpful for the better management of food raw materials in hotels, yet it has its own limitations in terms of the universe and sample size of the research. These need to be taken care off by the experts in future.

Originality/value – This paper shall provide base for further researches in the area of hospitality industry in India; as it is still in its novice stage.

Keyword(s): Food, Materials, Store, Hotel.

I. INTRODUCTION

India's Gross Domestic Product (GDP) is growing at a steady pace of around 7 per cent per annum since last four years. Thanks mainly due to healthy positive growth in different sectors of Indian economy; tourism and hospitality is at among the top two industries which has significantly contributed in this success story. Apart from this The Indian Travel & Tourism Industry is the third largest contributor to this scenario. World Travel and Tourism Council and Accenture (2008) reported that Indian hospitality industry is expected to increase with an average of 9.4 per cent over next ten years to generate almost US\$ 275.5 billion by 2018 (Tourism Satellite Accounting, World Travel and Tourism Council and Accenture, 2008). However, KPMG reported that Indian hospitality industry is anticipated to progress with 16.1 per cent CAGR to achieve a target of INR 2796.9 thousand by 2022. Its contribution is anticipated to be 3.9 per cent to India's national GDP) and will provide almost 52 million jobs by 2028 (WTTC, 2018). Foreign exchange earnings (FEE) from this sector of economy, during the period January-March 2018, were US\$ 8.228 billion with a growth of 20.4 per cent as compared to the US\$ 6.833 billion in January- March 2017 with a growth of 14.4 per cent over January- March 2016; which is quite significant, both, in terms of US\$ and growth rate (Ministry of Tourism, Govt of India, 2018).

This has been well supported with the growth in hotels all

over India. This increase has been registered in all categories of hotels be it five star or one star property. The main business of hotel organisations is to provide food and shelter i.e. accommodation to their guests. For which, like any other industry, they mainly produce food items, beverages, and sell rooms. The nature of their products is very different from products of manufacturing industries. Their main characteristics are perishability, inseparability, intangibility, heterogeneity. Therefore, these have to be produced and sold without much delay. Their production and service is responsibility of core departments of a hotel which include Food Production, Food and Beverage Service, Housekeeping, and Front Office. These are supported by numerous other departments such as Human Resources, Accounts and Finance, Sales and Marketing, Engineering and Maintenance, Security, and Stores. Stores department is responsible for purchasing, storing, receiving, issuing, and controlling the flow of different raw materials for the smooth functioning of hotels. So the department is to take delivery of, check, store correctly, issue goods as per the authorised requisitions with stern control at every step. This section also helps in cost calculations and budgeting for a hotel. Every supply is ensured for various parameters such as quality, weight and price. These are promptly taken into stock and sent to respective storage areas.

Mutkoski (1977) found that frozen items should be stored at a temperature of 0° F or below to maintain quality. Lower



the temperature, the longer the storage life of the product. Just as important as low temperature is stability of temperature. When temperature fluctuates by 10 or 15 degrees, two problems may result. The first is the growth of ice crystals inside the product. Free, or unbound, water becomes available with the rise in temperature. As the temperature drops, the free water refreezes, forming crystals that attach to existing crystals; these mega crystals disrupt cell structure, causing increased drip loss upon thawing. The second detrimental effect of temperature shifts is sublimation, a physical phenomenon whereby a portion of the water evaporates from the product, moving from the solid to the gaseous state (i.e., sublimating) without passing through the liquid state. The gaseous water then condenses on the product to form a snow-like covering but the moisture is lost from the product forever. These two factors can cause a substantial decrease in palatability.

Kotschevar (1968) propounded that a large percentage of time in food facilities may be claimed by the necessary handling of materials. Raw materials, tools, and utensils should be placed where they will require as little handling as possible. This means that items are separated into local storage in the individual work centers. Utensils and materials will not be in a central area but where they are first needed for work. Central or bulk storage will be used for large market packages that, for economical use of space, are to be divided later for storage in work centers. Where storage is to supply more than one area, the location is usually best where it will be in closest proximity to the area where the greatest number of trips will be made to it.

Chon and Sparrowe (2000) explained that personnel should weigh out, measure or count each item before distribution. A record of these transactions helps to maintain inventory control showing the quantities available for use or that need to be ordered, the dollar value of the products used or on hand, the food cost incurred for menu items, and the food cost percentage. In large foodservice operations, requisition forms are also used to monitor and control the flow of inventory, giving an additional tool for checking expenses and analyzing sales.

Shiring, Jardine, and Mills (2001) elaborated that the objective of storage, a major component of the purchasing process, is to maintain adequate space for perishable goods, dry goods, beverage, chemicals, and equipment. Organization of the storage area helps reduce clutter and prevents of merchandise. Frequent cleaning and sanitation eliminate potential insect and rodent infestation. Many establishments fail to recognize the potential loss through spoilage, pilferage and theft. Spoilage can be prevented by ordering the correct amount properly rotating stock, and having optimal environmental conditions.

The basic goal of storage management is to prevent loss of

merchandise due to theft, pilferage, spoilage (Feinstein and Stefanelli, 2005).

Assaf and Matawie (2009) studied the problems surrounding the operational performance of health care foodservice systems and provide a comprehensive comparison and analysis of the performance of all the different types of foodservice systems. They concluded that the foodservice managers are under increased pressure to reduce the operational costs of their departments while maintaining high productivity standards.

Davis, Lockwood, Pantelidis, and Alcott (2013) declared that the main objective of a food store is to ensure that an adequate supply of foods for the immediate needs of the establishment are available at all times. Food storage comes under food safety regulations and forms of the organisations HACCP policy.

Malik and Kumar (2014) studied purchasing practices prevailing in small hotels of Himanchal Pradesh. They concluded that budget, two-way communication, corporate values, govt laws, and mutual trust are of utmost importance that can affect the purchasing practices in the sampled hotels; keeping in mind the fact that the Indian hotel industry is one of the most rapidly growing segments of Indian economy and like any other business, right quality and quantity of raw material is the best tool to enhance their guests" satisfaction, quality of final products and, ultimately, profits.

Atia and Abdelgawad (2016) studied procedures used in receiving and storing at the central restaurants at the university dormitories. The findings advocated that food materials should be approved from competent authorities, clean, free from spoilage and misbranding, and hygienic. Even the delivery vehicles should be clean with no-pests and have correct temperature. The stores at university dormitories should be well ventilated, free of dampness and pests at right temperature. The employees should be offered training programs on food hygiene.

OBJECTIVE OF THE STUDY

It can be concluded from the existing literature that there is clear scarcity of research in India on storing of food materials in hotels. So this study wishes to fill this gap in the field of hospitality. Therefore, the main aim of this study was to recognize factors that affect the storage of food materials in sampled hotels of India.

II. METHODOLOGY

Data collection was done with help of a five point Likert type scale ranging from 1 to 5; where '1' *Not Important at all*, '2' *Least Important*, '3' *Important*, '4' *Very Important*, and '5' denoted *Most Important*. The questionnaire was developed with inputs from existing literature, industry professionals and academicians. The process helped in



identification 24 variables which found to be affecting the storing practices related to food materials in selected hotels. The officials responsible for purchasing and storing of food materials for the sampled hotels were the respondents for the study. A total of 160 hotels were approached in North India; however, 109 (68.13%) questionnaires were found to be usable, which was a good response rate.

The collected data was analysed using factor analysis with the help of PASW Statistics 18 to find out various practices adopted by sampled hotels to store food and beverage raw materials.

III. ANALYSIS

The value of KMO test (0.605) as shown in the Table: 1 indicating that data is fit for applying factor analysis on the items related to food & beverage department.

Factor analysis was used to reduce various studied variables into dimensions to spot the various store practices in the sampled hotels of India. The value of Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test has a value of 0.605; meaning thereby that the data is fit for factor analysis which is further supplemented by the significant value of Bartlett's Test of Sphericity at given degree of freedom (Table No. 1).

Table No.1 KMO and Bartlett's Test					
Kaiser-Meyer-Olkin Measure of Sampling 0.605					
Adequacy.					
Bartlett's Test of Sphericity	Approx. Chi-Square	845.380			
	df	171			
	Sig.	0.000			

Principal Component Analysis with Varimax Rotation method was used for factor extraction and the results are shown in Table No. 2 and 3, given below. Table No. 2 highlights the total variance explained by the variables and the factors of the storing practices. The results shows that a total of 68.337 per cent of variance in the practices related to string can be explained with the help of extracted factors; which is quite good.

Table No. 2 Total Variance Explained					
Component	Rotation Sums of Squared Loadings				
	Total	% of Variance	Cumulative %		
1	2.856	15.032	15.032		
2	2.602	13.692	28.724		
3	2.324	12.231	40.954		
4	1.838	9.676	50.630		
5	1.686	8.875	59.505		
6	1.678	8.832	68.337		
Extraction Method: Principal Component Analysis.					

Factor analysis resulted in drawing out six factors that were exerting effect on storing practices in hotels of the study, as shown in Table No. 3. The first factor, **Problems and Damage to store items**, with an eigen value of 2.856, has variables such as *Problem of rats and other pests in store*, *Hygiene & Sanitation Problem, Problem of shortage in inventory*, and *Damage done by pests is significant*. It is responsible for 15.032 per cent of variance.

0	Component					
	1	2	3	4	5	6
Problems and Damage to store items						
Problem of rats and other pests in store	0.829					
Hygiene & Sanitation Problem	0.794					
Problem of shortage in inventory	0.758					
Damage done by pests is significant	0.628					
Quality and Material						
Quality of item		0.715				
You are responsible for receiving		0.706				
Material forecasting is done		0.696				
Regular inventory		0.685				
Laws and Purchasing						
Knowledge of laws related to edible products			0.790			
Purchasing is done only once in a day			0.772			
Separate storage space for each item			0.655			
Purchasing is done from local market			0.592			
Standards						
Just-in time purchasing is practiced				0.833		
Alcoholic beverages are kept in store				0.507		
Standard Purchase Specifications				0.461		
Price and Suppliers						



Price of item		0.738	
Suppliers are identified in advance		0.708	
Store Practices			
Non- Alcoholic beverages are kept in store			0.710
Non perishable items are stored in store			0.699
Extraction Method: Principal Component Analysis.	· · ·	· ·	•
Rotation Method: Varimax with Kaiser Normalization. ^a			
a. Rotation converged in 7 iterations.			

The second factor, **Quality and Material**, consisted of four items i.e. *Quality of items*, *You are responsible for receiving*, *Material forecasting is done*, and *Regular inventory*; has eigen value of 2.602 with a variance of 13.692 per cent.

Variables related to **Laws and Purchasing** i.e. *Knowledge* of laws related to edible products, Purchasing is done only once in a day, Separate storage space for each item, and Purchasing is done from local market, a total of four items, constituted the third dimension for the study. This factor has an eigen value of 2.324 and a variance of 12.231 per cent.

Storing standards such as *Just-in time purchasing is practiced, Alcoholic beverages are kept in store,* and *Standard Purchase Specifications* were part of fourth factor, **Standards**, which contributed a variance of 9.676 per cent and an eigen value of 1.838.

Price and Suppliers was the fifth factor consisting of variables such as *Price of item*, and *Suppliers are identified in advance*. This dimension explained about 8.875 per cent of variance and has an eigen value of 1.686.

The sixth and last factor titled as **Store Practices** comprised of two variables i.e. *Non- Alcoholic beverages are kept in store*, and *Non perishable items are stored in store*. This factor could elaborate a variance of 8.832 per cent and an eigen value of 1.678.

IV. DISCUSSION

The analysis made it clear that various problems related to pests, hygiene & sanitation, shortage of inventory, and damage due to pests are of prime concern to the store officials of the sampled hotels. This may be due to the fact that it results in unnecessary wastage which adds up to the overall costs for the hotels. Quality aspect of food and beverage items was found to be great concern for hoteliers as it will affect the quality of the final product and ultimately the guests' satisfaction. The persons responsible for store in hotels understand the importance of material forecasting and proper inventory management practices. As these can be very helpful in maintain optimum stock levels at minimum investment and help in minimising wastage. They also stressed on the need to have knowledge of various laws related to different food and beverage items so as to avoid any legal issues for the hotels. However, the

storage of non-alcoholic beverages and non-perishable items was not of much concern for the studied hotels, as these are easy to store and don't require special arrangements, i.e. maintaining temperature and to be made for keeping these items.

All these has to be designed and performed in such a way that desired quality and quantity standards are achieved with minimum operational costs so as to maintain a competitive edge. This can be accomplished with the use of various computer softwares and technologies at different levels of process ranging from food procurement to food waste disposal. The situation becomes more demanding and challenging as special arrangements i.e. cold storage, airconditioning and heating equipments may be required for storing food materials in hotels.

V. CONCLUSION

Hotels are part of one of the fastest growing Hospitality and Tourism Industry. It is, mainly, responsible for satisfying the guests' demands related to food, beverages and rooms. Food and beverage items are highly perishable and tangible which require careful handling. Even, the raw food and beverage materials need to be stored at a particular temperature for a very limited time period. Otherwise, these can be easily damaged by pests and high temperature, and will contribute to unnecessary costs and guests' dissatisfaction. So to avoid such circumstances, hotels need to examine their storing practices. The paper used a 5 point Likert type scale questionnaire for people responsible for purchasing and storing food materials in sampled hotels. The analysis resulted in findings that hotels concerned about problems related to pests, hygiene & sanitation, shortage of inventory, and damage due to pests, as this amount in unnecessary losses to the organisations. Although, the findings can be very useful for better management of food raw materials in hotels; however, the universe and sample size of the research are its two main limitations which may be addressed by the researchers in future.

REFERENCES

 [1] Assaf, A. and Matawie, K. M. (2009) A Two-Stage Approach To Efficiency Modeling: an Application To the Australian Hospital Food Production Industry. https://doi.org/10.1177/1096348009338510



- [2] Atia, M. A. and Abdelgawad, A. R. (2016) Receiving and Storing Foods: The Procedures Followed in the Central Restaurants at University Dormitories. Minia Journal of Tourism and Hospitality Research Vol. 1, Issue 2, pp. 1-26.
- [3] Chon, K. S., and Sparrowe, R. T. (2000). Welcome to Hospitality: An Introduction, 2e. Delmar, a part of Cengage Learning Delhi
- [4] Davis, B., Lockwood, A., Pantelidis, I., and Alcott, P. (2013). Food and Beverage Management, 4 e, Routledge, Delhi.
- [5] Feinstein, A. H. and Stefanelli, J. M. (2005). Purchasing: Selection and Procurement for the Hospitality Industry, 6th edn., Hoboken, NJ: John Wiley Inc.
- [6] Kotschevar, L. (1968). Some Basic Factors in Food Service Planning. Cornell Hotel and Restaurant Administration Quarterly. 9. pp. 104-113.

- [7] Mutkoski, S. A. (1977). Frozen Portion-Control Meats: What the Food Service Operator Should Know About Them. Cornell Hotel and Restaurant Administration Quarterly. 18. pp. 17-19.
- [8] Malik, S. and Kumar, S. (2014). An Exploratory Analysis of Dimensions Affecting Purchasing of Food & Beverage Raw Materials for Small Hotels in Himanchal Pradesh. Asian Journal of Research in Business Economics and Management, Vol. 4, No. 12, pp. 188-194.
- [9] Shiring, Sr., S. B., Jardine, R. W. B. and Mills, Jr., R. J. (2001) Introduction to Catering: Ingredients for Success. Delmar, a part of Cengage Learning, Delhi
- [10] World Travel & Tourism Council (2018). Travel & Tourism: Economic Impact 2018 India
- [11] http://pib.nic.in/newsite/PrintRelease.aspx?relid=179033

