

Research Article

Research on Design Factors and Packing Design Method of Preschool Children's Food Packing Security

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Abstract: Preschool children belong to a special group. In order to study method of food packing design of them, this study firstly investigates children's food market, some parents and teachers of kindergartens, as well as some food security regulators of the relevant food security management departments. Then the article comes up with 5 design factors: the packing opening way, intelligence functions, graphics, color and text, which have greater impact on preschool children's food security. Based on these 5 factors; combined with the physiological and psychological characteristics of preschool children, it systematically analyzes the design method of the food packing security.

Keywords: Design, food packing, preschool children, security

INTRODUCTION

“Security” has broad and narrow points, involving national security, economic security, cultural security, food security, environment security and many other aspects, so “security” is a broad concept. In China, some scholars believe that: “security is the study of the people's physical and mental health and safety in production or other activities” (Wang, 2010). As the future of a nation and the vulnerable group in society, the healthy growth of children has become the focus of each family and the whole society. Although this concern degree is gradually deepening, but it is common to see a certain number of children who suffer from accident casualties and injury accidents caused by the food packing security have also frequently occurred. In order to reduce this damage, studying children's food security packing design method will be an effective solution. There exist some domestic researches on packing design of children's food security currently (Zhang, 2008; Li, 2010), which mainly aim at the whole groups of children, however, researches on food packing design method for preschool (3 to 6 years old) children are rarely found. In order to study preschool children's food packing design method, this study will choose some food market, kindergarten children and related food security management departments for investigating some parents, teachers and food security supervision personnel, then makes analysis of the main influencing factors of preschool children's food packing security and on the basis of these factors, it explores security design method of preschool children's food packing.

INVESTIGATION OF PRESCHOOL CHILDREN'S FOOD PACKING DESIGN SECURITY

Investigation object: Some parents and teachers in Bengbu Huayun supermarket, Bengbu Baida supermarket (Center branch), Bengbu RT Mart supermarket (Baolong branch), Bengbu Carrefour supermarket, Bengbu Bauhinia celebrities kindergarten, Bengbu peach and plum garden kindergarten and Bengshan kindergarten; some food security supervision personnel of Bengbu Food and Drug Administration Bureau and Anhui Food and Drug Administration Bureau.

Investigation contents: The article refers to “Food Packing Law of the People's Republic of China” and relevant experts' advice and it investigates 9 design factors including the packing opening way, graphics, color, text, built-in toys, desiccant, anti-counterfeiting design tips, warning design and educational function design which have influence on preschool children (3-6 years old) food packing security.

Investigation method: Provide questionnaire to the respondents; ask each respondent to choose 5 design factors which influence preschool children's food packing security most.

Investigation result: A total of 400 questionnaires were given out and 389 valid questionnaires returned, with the effective rate of 97.25%. Survey results show that the design of packing opening way, educational function design, graphics design, color design and text

Table 1: Preschool children's food packing security design factors questionnaire

No.	Influence factors	Frequency	Sorting
1	The design of packing's opening ways	369	1
2	Graphics design	273	3
3	Color design	267	4
4	Text design	255	5
5	The built-in toy	115	8
6	Desiccant	138	7
7	Anti-counterfeiting design tips	26	9
8	Warning design	199	6
9	Educational function design	303	2

design are the top 5 and the votes of the other four design factors affecting the security of packing are below average, as shown in Table 1.

SECURITY DESIGN METHOD OF PRESCHOOL CHILDREN'S FOOD PACKING

Based on the above findings, the article chooses 5 design factors as study objects, which affect preschool children food packing security most, explaining the use of the method and the matters needing attention in preschool children's food packing design.

Use of packing color: In three major elements of visual communication: graphics, color and text, the color is the most sensitive response of people's nervous system; therefore packing color should be perceived by consumers before graphics and text. Preschool children spend much of their time in the kindergarten or preschool, so they contact more and more new things, intelligence develops faster and faster and cognitive ability is also developing rapidly. In packing design, color can affect children's physical and psychological states, changing children's psychological emotion. In color designing of preschool children's food packing, it is required to combine with the properties of the products and make use of child's perception of various colors and preferences characteristics to design, for the purpose of stimulating their interests in food. Considering the safety, for preschool children, it is better to adopt bright colors in food packing design, to attract their attention. Of course, in the design process, designers still need to pay attention to characteristics of different genders because they maybe have their own preference of different colors. For example, for children puffed food "A lot of fish", there are 4 colors available: red, yellow, green and blue (Fig. 1).

Use of packing graphics: Piaget's cognitive stage development theory thinks that preschool children lack logical thinking and they often use symbols to represent their early sensor motor discovery (Sang, 2003). Many studies have shown that children in the process of growing have the principle of contrast sensitivity. Influenced by curiosity and thirst for knowledge, their preference for fancy graphics will become more and



Fig. 1: Children puffed food "A lot of fish"



Fig. 2: Tom and Jerry" octagonal cartoon biscuits

more obvious. Cognitive ability of preschool children have been greatly enhanced, by the graphics, they may perceive the information of the commodity packing. When choosing and buying food, they will be affected by their parents less and less, but they will be affected by their own consciousness. Therefore, in the children's food packing, reasonable graphic design will not only affect whether the food information can be passed correctly, but have great influence on the children's early visual sensitivity and intellectual development. Once the children's food packing design is used improperly, children's health and safety may be threatened.

In graphics designing of preschool children's food packing, it should be noted first that they must comply with properties of children's products, therefore, positive, upward and healthy graphics are preferable and dark, negative and unhealthy graphics are forbidden. Furthermore, the visual process on the graphic layouts should be emphasized and in the form, cartoon and animation images gladly accepted by preschool children are preferable. Emotions and feelings experience of preschool children should be fully considered, for avoiding the possibility that children may have inappropriate imagination or the bad mood.

Concrete expression forms: Concrete expression form is to show intuitive product appearance on food packing, which is the most direct form of expression. Preschool children's food can adopt some concrete expression forms like realistic painting and cartoon image to design packing graphics. For instance, in order to make "TOM AND JERRY" octagonal cartoon cookies (Fig. 2) more acceptable by consumers, designers design the whole packing box in octagonal cylinder. The exquisite packing contains TOM and JERRY, the two vivid and lively cartoon images with



Fig. 3: “Yake” dole lolly



Fig. 4: Fresh and easy cereal food packing

rich expression, which are children’s favorite. The packing arouses children and their parents’ resonance in emotion with strong visual feel, so as to stimulate consumer’s appetite and desire to buy.

Abstract expression forms: Not all of the goods are suitable for adopting concrete expression forms and abstract expression forms often also can have unexpected visual effects. Abstract expression forms are to join the non realistic graphics in the packing design, that is, to use the point, the line, the surface and other geometric elements to convey the inherent characteristics of goods with concise and free forms. The abstract expression forms are used to design some of the children’s food packing, sometimes making the goods convey nice effect; the abstract expression forms is used to design some of the children’s food packing, sometimes can make the goods convey good effect. For example, using circular graph (Fig. 3) to decorate candy packing can not only reflect the property of commodity well, but convey the commodity’s mouth feel and bridge the gap between consumers and commodity.

Decorative expression forms: Some commodities can adopt decorative expression forms to display product attributes, conveying product information through decorative elements of the graphic. In the pre-school children’s food packing design, simplified or exaggerated technique can be applied to process commodity image, because bright graphics can strongly attract the attention of consumers.

Graphics in preschool children’s food packing vary from one simple form to a variety of forms. But the use

of a variety of graphics and patterns must meet the requirements of visual balance, so as to be consistent with the child’s visual habit. The packing pattern in Fig. 4 is an animal which will insanely eat a bowl of its favorite cereal food, whose exaggerated expression makes images with unique visual characteristics, conscious to exaggerate the main expression of graphics and the main graphics cover the whole space, so that the overall picture has a visual emphasis, which achieves outstanding effect, to attract the attention of children as much as possible.

Use of packing text: As another important visual element in the packing design, the text design of packing can convey such important information as the product name, ingredients, cooking methods, production date, shelf life and dos and don’ts (Yin, 2004), so that consumers can understand the goods and its usage, at the same time, it can safeguard consumer’s safety. Preschool children’s literacy amount is limited, but a considerable part of food is bought by the guardians of them or bought under the guardians’ guidance, therefore, the security problem on using text in preschool children’s food packing should be paid enough attention. The text information should be clear and concise and it should objectively convey the information of product, at the same time, the font design should be vivid, so as to accord with the preference of the preschool children, which has very strong affinity and easily accepted by the children (Fig. 1, the font of the packing is lively and has a certain cartoon property catering to preschool children’s psychology, at the same time, the font color is bright, so it can be easily accepted by children). If the packing contains some warning logos, it should be designed normatively: the standard font and the color with strong visual impact should be generally used, in order to attract consumers’ attention.

Design of packing open modes: The important characteristics of preschool children are curiosity and courage to probe the unknown. They always like to open the packing independently and eat the food just being bought immediately. However, there are a lot of designs which are not reasonable enough for children’s food packing, it will bring potential safety hazard to young children because the outer packages aren’t difficult to open and the built-in desiccant bags which size might be wholly swallowed by children are too easy to open. Therefore, for the children’s food, the built-in desiccant bags should be designed that is waterproof (to prevent children from containing the bag in the mouth to avoid the harm of desiccant), tear proof and hard to swallow. The outer packages should be designed to open easily under the premise of protecting the fillings. So, on the one hand, it can avoid to harm children, on the other hand, it can greatly promote the sales of products, thereby increasing the profits of the



Fig. 5: "ARTISTRY" jelly



Fig. 6: Packing of pistachios for "New Farmer Brother"



Fig. 7: Packing of "DOOGY playing together" drink



Fig. 8: "Strong CiCi" drink

business because of convenient open modes and psychological characteristics of conformity of preschool children. The open modes of children's food outer package can be designed into the following several forms:

The open mode of tearing: Jelly food is generally more difficult to open. If preschool children want to eat these foods, they may bite by the mouth; the ink on the outer package may contaminate the children's mouth that could bring harm to the children's body. When designing open modes, the edge of the package should be designed to the saw tooth pattern (Fig. 3), which is easy to open, or indicates open direction with arrow on the package (Fig. 5). The children can gently open the package according to the indication of arrow. This open mode not only makes children eat conveniently, but also reduces the unnecessary damage and the concerns

of their parents. But this kind of open mode is non-recoverable; it generally applies to the packing with less built-in food, which can be eaten soon after opening.

The open mode of zippering: For dates, pistachios and some other small solid foods' package, if it adopts the open mode of tearing and the inside food can not be eaten in a short time; they can go bad because of the long time contact with the outside world. If the open mode of packing is designed into zippering form which uses slots of Yin and Yang combination (Fig. 6), then the package can be repeatedly open and close easily and has moisture-proof, hermetical role. The open mode of zippering is suitable for the small food packing, these small food are often packed in the box to transport, store up, generally speaking, will not run the risk of being opened. For larger packing of food, which are usually transported directly, often without outside protection, if it adopts the combination of open mode of zippering and tearing, the risks of being opened in the process of transportation and storage can be avoided.

The open mode of pushing: The two modes above-mentioned are applicable to the solid food unsuitable for the liquid food, such as drinks and mineral water, etc. The package of plastic bottle for liquid drinks can be designed into the open mode of pushing, which realizes the opening and closing of the drink bottle through lifting or pressing the cover. Figure 7 is the drink, "DOOGY playing together". Its outer package is designed from preschool children's psychology and uses the personality toys of DOOGY as the push-pull cover. It is convenient not only to carry, but to drink. This kind of packing has the characteristics reuse and tightness, which reduces the environmental pollution of the package waste.

The open mode of capping: The milk packing is usually divided into two kinds, Tetra Brick and Tetra Pak, in the market. Tetra Brick packing often uses the open mode of intubation and Tetra Pak packing often uses the mode of tearing. The merchants often use the plastic with large toughness as the inner packing film which is hard to be torn in order to keep the internal milk from leaking. It is unsafe and unhygienic for the preschool children to open by means of scissors or biting by the mouth. If the packing could be designed into the open mode of capping (Fig. 8), which is added with a lid on the package. As long as the children gently twist, the lid will be opened safely. It is safe, convenient and hygienic to design a straw underneath the lid that also can prevent the outflow of liquid when eating.

The design of educational function packing: Preschool children are in the rapid stage of the physical and mental development, the natural curiosity makes



Fig. 9: "Gibby Guest" high quality milk of Youku

them fill with great interest in everything. Under the premise of ensuring the basic functions of food packing, the designer can combine the cognitive characteristics of the preschool children with some intellectual and educational functions. Figure 9 is "Gibby Guest", a kind of high quality milk of Youku, which was produced by San Lu Group, the packing was designed into a form of "creative card of little genius", at the same time, each box of Gibby Guest with 3 pieces of "cyclone card" that makes the preschool children assemble toys of different shaped when they enjoy the delicious nutrition. It not only improves the children's ability of practice and thinking, but also strengthens their creative desires. The design of educational function packing is very important in promoting the healthy development of preschool children's physiology and psychology, stimulating their imagination and exercising their ideation. It succeeds in containing education in amusement and increases the additional value of products.

CONCLUSION

Through the investigation of children's food trading market, the part teachers and parents whose children in the kindergarten, as well as part food safety supervision personnel of the relevant food safety management

departments, we obtain that 5 design factors which are open modes, educational functions, graphics, colors and texts have a great impact on the preschool children's food safety. Combining the 5 factors with the physiological and psychological characteristics of preschool children, this study systematically analyzes the design method of the food packing safety. This will be of great significance for reducing the accidents and ensuring the healthy growth of preschool children.

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