

Consumer Responses to Perceptions of DCD in Milk Powder: A Case Study in the Southern Province of Sri Lanka

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Abstract

Dicyandiamide (DCD) is a chemical compound used by farmers to reduce the negative effects of greenhouse gas emission and nitrate leaching into water ways. It is a nitrogen-rich compound such as melamine which can be used as an economic food adulterant to enhance the apparent protein content of the food products. The present research was conducted to find out the consumers' awareness and knowledge regarding DCD issue recently emerged in Sri Lanka. Moreover it intended to identify whether the awareness of DCD has changed the consumers' milk consumption pattern and to verify that whether consumers have moved to fresh milk or to other alternative products. The field surveys were carried out at two selected clusters of Matara using cluster sampling technique. All families (76 families) in two selected areas were interviewed using a pre-tested structured questionnaire. Findings revealed that the majority (80%) of people are aware of DCD while out of them 7% of people were fully aware about the DCD issue. It was revealed that 67% of people have changed milk consumption pattern after awareness of DCD in milk powder. Sources of information about DCD were television (58%), newspapers (28%), radio (28%), and others such as shop keepers, relatives and internet (3%). With the awareness about the DCD consumption of imported milk powder especially Anchor and Nespray has remarkably decreased and demand for local milk powder such as 'Palawatta' and 'Highland' products has been increased. A few (7%) families have moved to fresh milk and (16%) families have moved to alternatives like coffee, "Beli mal" and "Kolakada" instead of milk powder. Based on the results of the study, it can be concluded that there is a significant impact of the awareness about DCD in milk powder on the consumption of milk powder implying that the people pay attention on food adulteration.

Keywords: Consumer behavior, Dicyandiamide (DCD), Milk powder

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Introduction

An adulterant is a substance found within other substances (e.g. food, beverages) although not allowed for legal or other reasons. The addition of adulterants is called adulteration. The usage of adulterants is common in societies with few legal controls on food quality monitoring by authorities, sometimes this usage has even extended to exceedingly dangerous chemicals and poisons (Danaher and Jordan, 2013). Food adulteration may increase the quantity, income and the profit and also increase the shelf life or keeping quality of foods. It controls the ripening of fruits and increases the appearance and quality.

The DCD (Di CynoDiamine - $C_4H_4N_4$) is a simple synthetic chemical compound consisted of elements of carbon, nitrogen and hydrogen. It is a nitrile derived from guanidine and dimer of cyanamide. 2-cynoguanidine which is soluble in water, acetone and alcohol. The 2-cyanoguanidine is produced by getting cyanamide with base. It is produced in soil by decomposition of cyano amide. DCD is a

nitrification inhibitor (Lucas, 2013). It is also used as a slow fertilizer. Dicyandiamide is a chemical compound used by farmers to reduce the negative effects of greenhouse gas emission and nitrate leaching into waterways. It has also been reportedly used by some to promote the growth of pastures where cows graze. Furthermore, dicyandiamide is a nitrogen-rich compound that is classified with compounds such as melamine as a potential economic food adulterant to enhance the apparent protein content of the food Product. It's a fertilizer by product that also causes health problems, from getting in to rivers and lakes. Though there are no international standards for the acceptable level of DCD in food products, in high doses of substances is toxic to human. In Sri Lanka, in past few years, the milk powder industry faced a crisis with the presence of small amounts of DCD in imported milk powder. In large scale importers, it was stated that if a ban is to be imposed it will greatly affect their individual industries as well as the market on the whole. All imported milk powder will lead to a massive imbalance in demand and supply of milk powder

as Sri Lanka does not have a sufficient supply of milk. Laboratory tests have revealed low levels of DCD residues in whole milk, skim milk powder, butter and milk powder. This study aims to reveal the awareness of DCD in the community and the consumers' response on awareness of DCD in milk powder. The major objectives of the study were to identify whether the awareness of DCD has changed the consumers' milk consumption pattern and to verify that whether consumers have moved to alternatives due to this DCD issue.

Materials and Methods

To understand the consumer awareness and knowledge regarding DCD issue and to identify whether the awareness of DCD has changed the consumer's milk consumption a pre-tested structured questionnaire was used in the field survey during interviews and numerous informal conversations with all families (76%) of Kanaththagoda road and Madiha-Walgama road in Matara to represent different kind of households in the population. A pre-tested structured questionnaire was used during face-to-face interviews. Findings were supplemented with information gathered in informal conversations. The awareness of the people about the DCD was classified under the scale of no knowledge (0), just heard only (1), moderate knowledge (2), good knowledge (3), very good knowledge (4). Descriptive statistics were used to present the findings and the Chi-Square test was employed to find the association between selected variables.

Results and Discussion

Results revealed that about 80% of the people are aware of DCD while about a half of the sample is having a perceptible knowledge about the DCD (Table 1).

With the awareness of DCD, 67% of population has changed their milk consumption pattern either by transferring to local milk powder or liquid milk and reducing the consumption of imported milk powder. Source of information for the awareness were from television (58%), news papers (28%), radio (11%), and other sources such as shopkeeper, relatives and internet (3%). Figure 1 shows changes of different milk powder and other alternatives consumed by people before arising the DCD issue and after the issue. According to the figure imported milk powder consumption specially Anchor and Nespray, has decreased considerably and demand for local milk powder like Palawatta and Highland products has increased. Meanwhile, 7% families

Table 1: Knowledge about the DCD

Different scale	Percentages of families
No knowledge	20
Just heard only	31
Moderate Knowledge	25
Good knowledge	17
Excellent knowledge	7

have moved to the fresh milk and 16% of families have moved to alternative products like coffee, "Beli mal" and "Kolakada" using locally available materials after the awareness of DCD issue. The Chi square analysis confirmed that there is an association between consumption of milk powder and the level of awareness about the DCD ($\chi^2 = 24.83$, Significant at $\alpha = 0.05$). People have moved towards local milk products and other alternatives instead of consuming imported milk products with awareness of DCD issue.

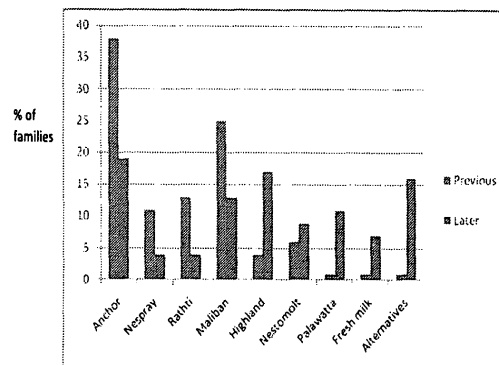


Figure 1: Changes in milk consumption pattern after DCD issue

Conclusion

According to survey, most of the people have changed their milk powder consumption pattern after the awareness of DCD issue. They have moved from imported milk powder to local milk powder, to fresh milk and to other alternatives. There is a significant association between milk consumption and knowledge about DCD after the awareness of DCD issue.

Reference

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