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Awareness of Intermediaries on the Concept of Eco-health Practices in Dairy Sector in Andhra Pradesh

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ABSTRACT

India is one of the largest and fastest growing markets for milk and milk products in the world. The massive increase in milk and milk product demand has compelled small-scale intermediaries to engage in unethical practises that jeopardise product safety measures, raising public health concerns, and polluting the environment. Therefore, an attempt was made find out the awareness of intermediaries in dairy sector on concept of Eco-health practices with respect to environmental aspects, human aspects and product safety using ex-post facto research design. The study was conducted in three different regions of Andhra Pradesh state and one district from each region was selected purposively. Total 60 intermediaries were randomly selected i.e. 10 from rural and 10 from urban area of each district with the help of interview schedule. The findings revealed that there was a significant ($P < 0.01$) positive relationship between the independent variables like education, gross annual income, mass media exposure, extension contact and information seeking behaviour with awareness of intermediaries on Eco-health practices.

Key words : Intermediaries; Andhra Pradesh; Eco-health Practices; Awareness; Dairy Sector.

Milk plays an important role in diets globally (Kamana et al, 2014). Milk is a complex mixture of macro and micro-nutrients and a rich source of proteins, fats, carbohydrates, minerals and vitamins (Dugum & Janssens, 2015). Milk production is an important livelihood source for smallholder dairy farmers in developing countries like India. However, milk quality and safety are a challenge not only at the production level but also at the procurement, transporting, processing and at distribution level. So milk producer was not the only person to maintain hygienic practices but also the intermediaries.

The Concept Eco-health practices add precision and predictive power to observations pertaining to infectious diseases and risk factors in humans and animals. The Eco-health practices make them aware of the linkage between the Environment-Human-Animal. It also helps them to aware of their role in quality maintenance, make them aware of risks due to unethical activities and maintain milk quality from collection to distribution. These practices can increase

the commitment for quality, help them to predict the milk quality from producers can understand what consumers really expect from intermediaries, increase the knowledge regarding the environmental impact on quality maintenance and health risks. Majority of the researches were focusing on dairy farmers so a study was planned to document awareness of rural and urban intermediaries from three districts of Andhra Pradesh state towards Eco-health practices in dairy sector with respect to environmental aspects, human aspects and product safety.

METHODOLOGY

The present study was carried out in three regions of the state of Andhra Pradesh. Chittoor district in Rayalaseema, Krishna district in Coastal, and Vishakhapatnam district in North coastal region were chosen from each region. Ten rural and ten urban intermediaries were chosen at random from each district, for a total of 60 from three districts. Rural and urban intermediaries were personally interviewed with

the help interview schedule. The intermediaries were categorized based on the value obtained by dividing the maximum possible score with three since they were grouped separately into three categories i.e., low, medium and high level of awareness. The range for low, medium and high level of awareness for Eco-health practices with respect to environmental aspects was <4, 4-6 and >6, for human aspects was it was <3, 3-5 and >5 and for product safety was <4, 4-7 and >7 and respectively. The awareness was measured on two point continuum i. e. aware (score 1) and not aware (score 0). The collected data was tabulated and analysed with the help of SPSS version 23.

RESULTS AND DISCUSSION

It is evident from Table 1 that the mean percentage of Visakhapatnam district rural and urban intermediaries regarding awareness on Eco-health practices with respect to environmental aspects was 42.22 per cent and 55.55 per cent. As for awareness on Eco-health practices with respect to human aspects as shown in Table 2, the mean percentages of Visakhapatnam rural and urban intermediaries was 12.85 per cent and 18.57 per cent. The mean percentage of Visakhapatnam district rural and urban milk producers in reference to awareness on Eco-health practices with respect to product safety as shown in Table 3 was 22 per cent and 33 per cent.

The data furnished under Table 1 that the mean percentage of Krishna district rural and urban intermediaries regarding awareness on Eco-health practices with respect to environmental aspects was 57.78 per cent and 65.55 per cent. Regarding awareness on Eco-health practices with respect to human aspects as shown in Table 2, the mean percentages of Krishna rural and urban intermediaries was 18.57 per cent and 25.71 per cent. From 3 it was clear that the mean percentage of Krishna rural and urban intermediaries regarding awareness on Eco-health practices with respect to product safety was 37 per cent and 52 per cent.

A glance at Table 1 reveals the mean percentage of Chittoor district rural and urban intermediaries regarding awareness on Eco-health practices with respect to environmental aspects was 62.2 per cent and 68.88 per cent. As for awareness on Eco-health practices with respect to human aspects as shown in Table 2, the mean percentages of Chittoor rural and urban intermediaries was 31.44 per cent and 45.71 per cent. From Table 1 it was clear that the mean percentage of rural and urban intermediaries regarding awareness

on Eco-health practices with respect to product safety was 43 per cent and 59 per cent.

The mean percentages for awareness on Eco-health practices with respect to environmental aspects was above 50 per cent in Krishna and Chittoor district and for product safety only Chittoor district has mean percentage of above 50 per cent. This may be due to medium level of income, lack of awareness on extension services, lack of training programs for intermediaries compared to other stakeholders in dairy sector, and they perceive that it's the duty of intermediaries to produce safe milk. Some of the intermediaries who had awareness may follow unethical activates to keep milk temporarily fresh to prevent financial losses due to spoilage (Naz, 2000). So there is need to educated intermediaries regarding their roles in dairy sector, there is necessity to provide information on standards to follow for supply of safe milk and public health hazards due to adulteration and unethical activities. The results are similar with the results of *Dah et al. (2019)*, *Weldekidan et al. (2019)* and *Lindahl et al. (2018)*.

It was found from Table 2 that majority of the intermediaries from rural and urban areas of Visakhapatnam (60% & 100%) Krishna (90% & 70%) and Chittoor district (80% & 60%) had medium level of awareness regarding environmental aspects. With respect to human aspects majority of the urban and rural intermediaries of Visakhapatnam (90% & 90%) and Krishna (80% & 70%) district had low level of awareness, whereas majority of rural and urban intermediaries of Chittoor district (50% & 60%) had medium level of awareness. Regarding awareness on Eco-health practices with respect to product safety, majority of the rural and urban intermediaries from Visakhapatnam (80% & 60%) district had low level of awareness. Whereas majority of the rural intermediaries of Krishna (50%) and Chittoor (50%) district had low level of awareness and urban intermediaries had high level of awareness (50% & 50%) respectively. The findings are a bit similar with the findings of *Dah et al. (2019)* and *Lindahl et al. (2018)*.

This may be due to the fact that majority of the intermediaries from both rural and urban area assume that milk producer was responsible for milk hygiene. In addition to that lower level of education, income, communication profile and lack of accessibility to market in rural areas compared to urban area was the key factor for low level of awareness. Even though urban area intermediaries had higher awareness score

Table 1. Awareness of intermediaries on eco-health practices with respect to environmental aspects, human and product safety aspects

Awareness about	Visakhapatnam			Krishna			Chittoor		
	Rural area (n=10)	Urban area (n=10)	Overall (N=20)	Rural area (n=10)	Urban area (n=10)	Overall (N=20)	Rural area (n=10)	Urban area (n=10)	Overall (N=20)
<i>Environmental aspects</i>									
Biosecurity measures	0(0)	0(0)	0(0)	1(10)	2(20)	3(15)	2(20)	2(20)	4(20)
Climate change impact on dairy sector	2(20)	4(40)	6(30)	4(40)	6(60)	10(50)	5(50)	7(70)	12(60)
Measures for reducing pollution from dairy sectors	0(0)	0(0)	0(0)	0(0)	1(10)	1(5)	0(0)	2(20)	2(10)
Dairy sector's contribution to water pollution	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1(10)	1(5)
Importance of cleanliness around farm premises	7(70)	9(90)	16(80)	9(90)	10(100)	19(95)	9(90)	10(100)	19(95)
Are you aware that un hygiene environment can increase vector population which in turn causes problems to humans?	8(80)	10(100)	18(90)	10(100)	10(100)	20(100)	10(100)	10(100)	20(100)
Environment has great impact on milk production and human health	7(70)	9(90)	16(80)	9(90)	10(100)	19(95)	10(100)	10(100)	20(100)
Ill effects on environment due to human activities	7(70)	9(90)	16(80)	9(90)	10(100)	19(95)	10(100)	10(100)	20(100)
Humans-Animals-Environments interface can also be a source of diseases	7(70)	9(90)	16(80)	10(100)	10(100)	20(100)	10(100)	10(100)	20(100)
Mean percentage	42.22	55.55	48.89	57.78	65.55	61.66	62.2	68.88	65.55
<i>Human aspects</i>									
Anthroponotic diseases	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Zoonotic diseases	0(0)	0(0)	0(0)	2(20)	5(50)	7(35)	4(40)	6(60)	10(50)
Awareness about correct milking methods	0(0)	0(0)	0(0)	1(10)	2(20)	3(15)	2(20)	5(50)	7(35)
Awareness about general management practices to be followed in milking shed	6(60)	8(80)	14(70)	5(50)	6(60)	11(55)	10(100)	10(100)	20(100)
Symptoms of some commonly occurring diseases in dairy animals	2(20)	3(30)	5(25)	3(30)	3(30)	6(30)	3(30)	4(40)	7(35)
Antimicrobial resistance	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Hygiene practices to be followed by intermediaries throughout the entire process from milk collection to distribution	1(10)	2(20)	3(15)	2(20)	2(20)	4(20)	3(30)	7(70)	10(50)
Mean percentage	12.85	18.57	15.71	18.57	25.71	22.14	31.44	45.71	38.57
<i>Product safety aspects</i>									
Basic measures for clean milk production	2(20)	4(40)	6(30)	4(40)	6(60)	10(50)	5(50)	5(50)	10(50)
Are you aware why experts recommend to discard fore-strips of milk	7(70)	8(80)	15(75)	7(70)	10(100)	17(85)	10(100)	10(100)	20(100)
Antibiotic withdraw period	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Diseases that can spread from milk	0(0)	0(0)	0(0)	1(10)	2(20)	3(15)	2(20)	3(30)	5(25)
Maintaining the cold chain of surplus milk	4(40)	6(60)	10(50)	5(50)	5(50)	10(50)	5(50)	8(80)	13(65)
Milk testing centers	1(10)	1(10)	2(10)	1(10)	5(50)	6(30)	2(20)	5(50)	7(35)
Various types of milk available in market (eg: skim milk double toned milk etc.)	1(10)	3(30)	4(20)	5(50)	6(60)	11(55)	3(30)	7(70)	10(50)
Different types of milk products	6(60)	7(70)	13(65)	9(90)	10(100)	19(95)	9(90)	10(100)	19(95)
Basic quality tests for milk and milk products	0(0)	2(20)	2(10)	3(30)	5(50)	8(40)	4(40)	6(60)	10(50)
California mastitis test	0(0)	2(20)	2(10)	4(20)	5(50)	9(45)	3(30)	5(50)	8(40)
Mean percentage	21	33	27	37	54	45.5	43	59	51

Figure in parenthesis indicate percentage

Table 2. Distribution of intermediaries according to their awareness score

Awareness	Category	Visakhapatnam		Krishna		Chittoor	
		Rural area (n=10)	Urban area (n=10)	Rural area (n=10)	Urban area (n=10)	Rural area (n=10)	Urban area (n=10)
Environmental aspects	Low (<4)	4(40)	0(0)	0(0)	0(0)	0(0)	0(0)
	Medium (4-6)	6(60)	10(100)	9(90)	7(70)	8(80)	6(60)
	High (>6)	0(0)	0(0)	1(10)	3(30)	2(20)	4(40)
Human aspects	Low (<3)	9(90)	9(90)	8(80)	7(70)	5(50)	4(40)
	Medium (3-5)	1(10)	1(10)	2(20)	3(30)	5(50)	6(60)
	High (>5)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Product safety	Low (<4)	8(80)	6(60)	5(50)	4(40)	5(50)	3(30)
	Medium (4-7)	2(20)	4(40)	3(30)	1(10)	2(20)	2(20)
	High (>7)	0(0)	0(0)	2(20)	5(50)	3(30)	5(50)

Figure in parenthesis indicate percentage

compared to rural areas, but it was not upto mark. So irrespective of location there is a need to increase awareness level of intermediaries regarding Eco-health practices and its importance for public safety.

The data presented in Table 3 reveals the relationship between the independent variables of intermediaries with their awareness on Eco-health practices. The variables such as education, gross annual income, mass media exposure, extension contact and information seeking behaviour has positive and significant relationship with awareness on Eco-health practices in dairy sector at one per cent level.

Education has positive and significant relationship with the awareness level of intermediaries at Eco-health practices which may suggest that the higher the education levels the higher the awareness regarding Eco-health Practices. Regarding gross annual income, there was a significant positive relationship with the awareness of intermediaries. This may be due to the fact that higher the income returns there will be higher the investment in dairy sector for collecting and distributing of clean and hygienic. Mass media exposure had positive and significant relationship with the awareness of intermediaries with the Eco-health practices which convey that more the mass media exposure more the awareness regarding Eco-health practices

Extension contact has positive and significant relationship with awareness of intermediaries on Eco-health practices which may be due to the fact that continuous contact with extension officials leads to knowledge acquisition. Information seeking behaviour has positive and significant relationship with the dependent variable.

Table 3. Relationship between the independent variables and awareness scores of intermediaries on Eco-health Practices (N=60)

Variables	Awareness on Eco-health Practices
Age	-0.459**
Gender	-0.175 ^{NS}
Education	0.911**
Family size	-0.233 ^{NS}
Family type	-0.358**
Main occupation	0.171 ^{NS}
Land holding	0.008 ^{NS}
Experience in dairy sector	-0.047 ^{NS}
Gross annual income	0.515**
Mass media exposure	0.872**
Extension contact	0.843**
Information seeking behaviour	0.874**
NS-Non significant; *Significant at 5%;	
**Significant at 1%	

Intermediaries with higher information seeking behaviour had higher awareness regarding Eco-health practices. This trend may be due to the fact that formal and informal sources will provide more information. So there is a need to strengthen them.

CONCLUSION

The present research concluded the awareness of intermediaries towards Eco-health practices with respect to and Environmental aspects human aspects and product safety was low in rural areas of Visakhapatnam, Krishna and Chittoor districts compared to urban areas and even in urban areas it was not upto mark. This may be due to the fact that majority of the intermediaries from both rural and urban area assumes that milk producer was responsible

for milk hygiene. There was a positive and significant relationship between the independent variables like education, gross annual income, mass media exposure, extension contact and information seeking behaviour with awareness on Eco-health practices. So, lower the level of education, income, communication profile and lack of accessibility to market in rural areas compared to urban area was the key factor for low level of awareness. So irrespective of location there is a need

to increase awareness level of intermediaries regarding Eco-health practices and its importance for public safety by using different mass media, experts from different fields for better understanding of their roles in dairy sector and its importance in dairy sector for reducing pollution.

CONFLICTS OF INTEREST

The authors have no conflicts of interest

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