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Working Capital Management and Liquidity Analysis of Selected Cooperative Milk Plants of Punjab

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Abstract: Dairy farming has been an important secondary profession among the rural population of the country. Milk cooperatives had been developed on 'Anand Pattern' through "Operation Flood" in the country played an important role for the dairy development of the country. Dairy development in the state of Punjab owed its origin to the dairy cooperative movement initiated by The Punjab State Cooperative Milk Producers Federation Limited popularly known as 'MILKFED'. This study is an attempt to analyze the working capital and liquidity position of six milk plants affiliated to the referred milk cooperative. Six cooperative milk plants have been selected two with highest turnover, two with medium and two with least turnover based on their average turnover. Data has been analyzed by calculating average net working capital and liquidity ratios of the selected milk plants and further by applying one-way ANOVA and independent sample t-test on these liquidity ratios for statistical analysis. The study has revealed that the liquidity position of the selected milk plants is not satisfactory. Keywords: Anand Pattern, Liquidity Ratios, Milk Cooperatives, liquidity Analysis, Working Capital

I. INTRODUCTION

Dairy farming has been an important associated activity in India. The need for dairy development in countries like India was stimulated due to many reasons like unemployment, low per capita availability of milk, improving the living conditions of pastoral people, achieving self-reliance in milk production etc. [1]. Indian dairy industry was earlier, based on traditional methods had no proper procurement and distribution system. "Operation Flood" was an important contribution for the cooperative dairy development in the country based on 'ANAND' pattern. The milk cooperatives developed a ready market of milk and its products for the farmers without the help of middlemen. They also helped them to get suitable prices of their products and provided them various infrastructural facilities [2].

A. Dairy Cooperatives in Punjab

Dairy farming has been an ancient secondary profession in the rural areas of Punjab and dairy co-operatives are promoting it with the help of new methods and techniques. The Punjab State Cooperative Milk Producers Federation Limited popularly known as MILKFED is the main cooperative based on 'ANAND' pattern for the dairy development in the state. The setup of MILKFED organization is a three-tier system from village level societies to district level central milk unions of primary milk producers' cooperative societies and controlled by the central federation at the state level. MILKFED is serving countrywide consumers through its strong network and distribution channels with extensive variety of milk products [3].

II. LITERATURE REVIEW

Kaur (2012) [4] studied the cash management of MILKFED and HDDFC by calculating liquidity ratios and revealed that liquidity position of MILKFED was better than HDDCF. Further some measures were suggested to improve the overall growth and expansion of business of HDDCF and for efficient use of assets of MILKFED. Mathur, Swarnkar and Soni (2014) [5] analyzed the working capital, liquidity and profitability of five units of Rajasthan Dairy Federation by calculating the liquidity ratios and concluded that the liquidity position of these unions was different among themselves. While Ajmer union had high liquidity position, Alwar had high debt exposure and bad liquidity position, Bhilwara had good liquidity position, Jaipur and Udaipur were at the improving stages of liquidity. Patel & Patel (2014) [6] analyzed the Profitability ratios of the milk cooperatives in Valsad and concluded that the maximum financial indicators of the cooperative society were not very good. It was further indicated that the



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various profitability ratios were also not satisfactory. Soni (2017) [7] evaluated the working capital management of Tirhut Milk Union Muzaffarpur by using ratio analysis and trend percentage and revealed that the working capital management of the union was not satisfactory for the given period of study and suggested measures to improve the same. Kunte and Patankar (2017) [8] evaluated the financial performance of dairy units in Maharashtra by using Return on Investment and profitability ratios. The study concluded that the liquidity position of these dairies was not satisfactory, and the ROI was inconsistent due to inconsistency in profits.

After reviewing the available literature, it has been observed that no such study has been conducted to analyze the working capital and liquidity of individual cooperative milk plants affiliated to MILKFED. So, this study is an effort to fill the gap.

A. Working Capital management

Working Capital is indispensable for the smooth running of any business organization. It is considered as the "lifeblood of a business". Every business requires long term funds for purchasing fixed assets and short-term funds for the purchase of raw materials and for meeting other day to day expenses. Working Capital is very important aspect to understand the firm's ability to conduct its day to day affairs in a smooth way [10], [11]. Working capital is used in different senses. **Gross working capital** is the total of all the Current assets. Gross working capital is to be preferred because it provides accurate amount of working capital at the right time. Every management is more interested in knowing the total amount of current assets with which it must operate than the sources from where it is made available. Net working capital is the difference between current assets and current liabilities. It is the part of current assets which has been financed through long term funds. It is always better to finance the permanent requirement of current assets from long term sources of funds and short term are to be used for provisional or cyclical variations [10], [11]. Sometimes there is negative working capital which is the result of excess of current liabilities over the current assets. It shows that some of the short-term sources have been used to finance the fixed assets also, which is technically wrong. In fact, no firm can survive for a longer period with a negative working capital. Working capital management is the management of current assets of business in an efficient manner.

B. Liquidity Ratios

Liquidity ratios reflect the ability of a firm to meet its short-term commitments at the right time. For analysing the liquidity position of milk plants their Current ratio, Quick ratio and Absolute quick ratio have been calculated and interpreted. *Current Ratio:* It is the ratio between current assets and current liabilities. As per norms it should be 2:1 [10], [11]. *Quick Ratio:* It is the ratio between Quick assets and current liabilities. Quick assets are calculated by deducting inventories and prepaid expenses from the current assets. As per norms it should be 1:1[10], [11]. *Absolute Quick Ratio:* It is the ratio between Absolute Quick assets and current liabilities. Absolute quick assets which can be readily convertible in cash. They include cash balance, balance at bank and the marketable securities. In case of these cooperative milk plants cash and bank balance has been taken, because no marketable securities have been available in the financial statement of these milk plants. As per norms it should be 0.50:1 [10], [11].

III. OBJECTIVE OF THE STUDY

To analyze the working capital and liquidity position of selected cooperative milk plants of Punjab over a period of 10 years.

IV. RESEARCH METHODOLOGY

This study is based on the secondary data collected from annual reports of the selected cooperative milk plants, annual report of MILKFED, published articles from different online journals and different books.

A. Sample of Study

Sample size has been selected based on average sales turnover of last three years selecting two with highest turnover, two with least turnover and two with medium turnover basis affiliated to 'MILKFED'. Among the six cooperative milk plants under study, Mohali and Ludhiana milk plants had highest turnover, Amritsar and Patiala milk plants had medium turnover and Gurdaspur and Hoshiarpur had the least turnover during the relevant period of study.

B. Period of Study

The results of the study are based on the data of selected cooperative milk plants during the period 2005-06 to 2014-15.

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C. Data Analysis Techniques

The data has been analyzed by calculating net working capital of each of the selected six cooperative milk plants along with average net working capital and liquidity ratios. For statistical analysis, one-way ANOVA & independent sample t-test (using SPSS version 23) have been applied on these ratios during the relevant period of study.

V. RESULTS AND DISCUSSION

A. Average Working Capital of Selected Cooperative Milk Plants

As per the results shown in Table 1, Working Capital of only two milk plants Mohali and Ludhiana were positive. It was Rs. 181.49 lakh and Rs.242.07 lakh respectively. All the other four milk plants were showing average negative working capital. It was Rs. -25.33 lakhs in Patiala, RS. -68.46 lakhs in Hoshiarpur, Rs. -231.77 lakhs in Amritsar and Rs. -235.50 lakhs in Gurdaspur. On comparing average working capital of six milk plants year wise, it was positive in only two financial years i.e. 2005-06 and 2011-12. It was Rs.74.80 Lakh in 2005-06 and Rs.3.97 lakh in 2011-12. On an average of all the six milk plants the results were also negative. It has been pertinent to mention here that only highest turnover milk plants were showing positive results during the period of study, medium turnover and least turnover milk plants were showing negative results for all the years shown in figure 1. It was due to excess of current liabilities over the current assets. Which is technically not good for these milk cooperatives. The pattern of average working capital was different among the different categories of milk plants. It was positive in highest turnover milk plants, but it was negative in medium and least turnover milk plants. (Fig.1)

Ludhiana Year Mohali Amritsar Patiala Gurdaspur Hoshiarpur Average 2005-06 142.18 228.35 298.57 -30.27-129.85-60.1674.80 2006-07 152.45 228.52 -343.15 -31.47 -159.96 -57.13 -35.12 2007-08 148.89 251.96 -378.31-31.53 -187.71 -65.13-43.64-53.56 2008-09 160.54 299.95 -418.60 -22.57 -205.53 -39.96 2009-10 166.87 180.61 -142.30-28.35 -201.19 -12.41-50.08178.19 199.91 -72.59 -291.68 2010-11 -289.50 -43.95 -53.27 2011-12 211.80 350.03 -241.16 -35.26 -241.34 -20.26 3.97 2012-13 241.97 222.36 -285.65 -2.73 -285.31 -89.53 -33.15 2013-14 158.18 284.26 -232.95 9.28 -274.48 -95.83 -25.26 2014-15 253.81 174.81 -284.67 -7.86 -377.96 -148.95 -65.14 181.49 242.07 -231.77 -25.33 -235.50 -68.46 -22.92 Average

Table 1: Average Working Capital of Selected Cooperative Milk Plants (Amount in Rs. Lakh)

Source: Annual Reports of Selected Cooperative Milk Plants 2005-06 to 2014-15

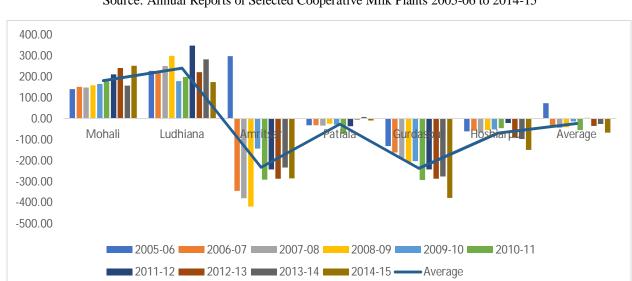


Figure 1: Average Working Capital of Selected Cooperative Milk Plants





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B. Liquidity Ratios of Selected Cooperative Milk plants

For analysing the liquidity position of selected cooperative milk plants their Average Current ratio, Quick ratio and Absolute quick ratio have been calculated and interpreted.

C. Average Current Ratio of Selected Cooperative Milk Plants

On analysing the current ratio of the selected cooperative milk plants under study, it was observed that it was less than the norms. It was more than 2 in milk plant Mohali during the period 2005-06 & 2006-07, in milk plant Ludhiana it was more than 2 during the three years i.e. 2005-6,2006-07 and 2008-09. In other years it was less than the norms. On an average it was 1.83 for Mohali & 1.80 for Ludhiana. But in all the other milk plants it was even less than 1. It was lowest in Amritsar (0.34), 0.37 in Gurdaspur,0.66 in Hoshiarpur,0.76 in Patiala. (Table 2). Further the pattern of average current ratio was same between the highest turnover milk plants. Between the medium turnover and least turnover milk plants one was having more and other was having less average current ratio. (Fig.2)

	rable 2: Average Current Ratio of Selected Cooperative Wilk Plants							
Year	Mohali	Ludhiana	Amritsar	Patiala	Gurdaspur	Hoshiarpur	Average	
2005-06	2.34	2.22	0.17	0.70	0.33	0.58	1.05	
2006-07	2.27	2.09	0.19	0.74	0.29	0.61	1.03	
2007-08	1.92	1.89	0.22	0.69	0.33	0.60	0.94	
2008-09	1.86	2.59	0.21	0.75	0.35	0.65	1.07	
2009-10	1.73	1.58	0.27	0.71	0.38	0.70	0.90	
2010-11	1.55	1.56	0.32	0.38	0.26	0.72	0.80	
2011-12	1.55	1.96	0.44	0.66	0.46	0.91	1.00	
2012-13	1.81	1.36	0.45	0.97	0.49	0.66	0.96	
2013-14	1.41	1.58	0.58	1.08	0.46	0.61	0.95	
2014-15	1.86	1.18	0.52	0.93	0.38	0.53	0.90	
Average	1.83	1.80	0.34	0.76	0.37	0.66	0.96	

Table 2: Average Current Ratio of Selected Cooperative Milk Plants

Source: Annual Reports of Selected Cooperative Milk Plants 2005-06 to 2014-15

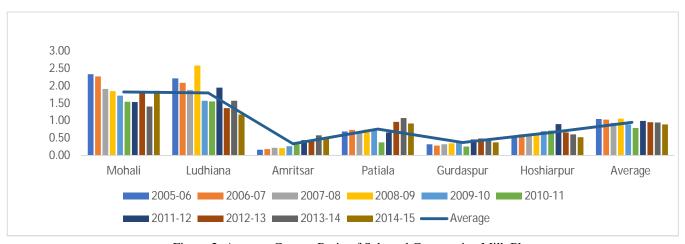


Figure 2: Average Current Ratio of Selected Cooperative Milk Plants

For statistically analyzing the variance in the average current ratios among the selected six cooperative milk plants, one-way ANOVA has been applied and between the milk plants of higher, medium and least turnover under study, independent t-test has been applied on the annual average current ratios of all the milk plants. For this purpose, the following null hypothesis has been framed.



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Ho: There is no significant difference in the current ratio of selected cooperative milk plants.

H₁: There is significant difference in the current ratio of selected cooperative milk plants.

The results presented in table 3 indicated that there has been significant difference in the current ratio among the six cooperative milk plants under study (p<0.050) at 5% significance level. As a result, the null hypothesis has been rejected [12]. So, it has been proved that there has been significant difference among the current ratio of all the six milk plants.

But in case of Highest Turnover, Medium Turnover and Least Turnover milk plants the p-value has not found to be significant (p>0.050). So, in this case the null hypothesis has been accepted. Hence it has been proved that there was no significant difference in the current ratio of Highest Turnover, Medium Turnover and Least Turnover milk plants.

Table 3: Statistical analysis of Current Ratio of Selected Cooperative Milk Plants using One-Way ANOVA & t-test

	One-V	Vay ANOVA						
	Sum of Squares	df	Mean Square	F	Sig.			
Between Groups	23.283	5	4.657					
Within Groups	3.152	54	.058	79.786	.000			
Total	26.434	59						
	Independe	ent Sample t-test						
		Highest Turnove	r Milk Plants					
	t		df	S	ig.			
	.175		18	.1	76			
Equal Variance Assumed	Medium Turnover Milk Plants							
	-5.467		18	.8	310			
	Least Turnover Milk Plants							
	6.901		18	.6	571			

D. Average Quick Ratio of Selected Cooperative Milk Plants

On analysing the average quick ratio for all the six cooperative milk plants under study, it has been observed that it was than less the norms. It was more than 1 in milk plant Mohali during the period 2005-06 to 2008-09 but during the remaining period of study, it was less than the norms, in milk plant Ludhiana it was less than 1 during the whole period of study. On an average it was 0.91 for milk plant Mohali and 0.50 for milk plant Ludhiana. But in all the other milk plants it was even less than 0.50. It was lowest in Gurdaspur (0.09), 0.12 in Amritsar,0.14 in Hoshiarpur and 0.36 in Patiala. (Table 4). The pattern of average quick ratio was different among the six milk plants. It ranges between the lowest 0.09 in milk plant Gurdaspur to highest 0.91 in milk plant Mohali. (Fig.3)

Table 4: Average Quick Ratio of Selected Cooperative Milk Plants

Year	Mohali	Ludhiana	Amritsar	Patiala	Gurdaspur	Hoshiarpur	Average
2005-06	1.49	0.88	0.06	0.23	0.08	0.17	0.49
2006-07	1.15	0.88	0.04	0.32	0.08	0.16	0.44
2007-08	1.04	0.46	0.03	0.32	0.05	0.04	0.32
2008-09	1.01	0.66	0.07	0.26	0.06	0.26	0.39
2009-10	0.97	0.88	0.07	0.42	0.04	0.05	0.40
2010-11	0.83	0.27	0.05	0.10	0.05	0.15	0.24
2011-12	0.72	0.33	0.04	0.19	0.09	0.10	0.24
2012-13	0.60	0.18	0.07	0.63	0.15	0.09	0.29
2013-14	0.59	0.33	0.26	0.78	0.18	0.25	0.40
2014-15	0.73	0.09	0.48	0.39	0.08	0.09	0.31
Average	0.91	0.50	0.12	0.36	0.09	0.14	0.35

Source: Annual Reports of Selected Cooperative Milk Plants 2005-06 to 2014-15

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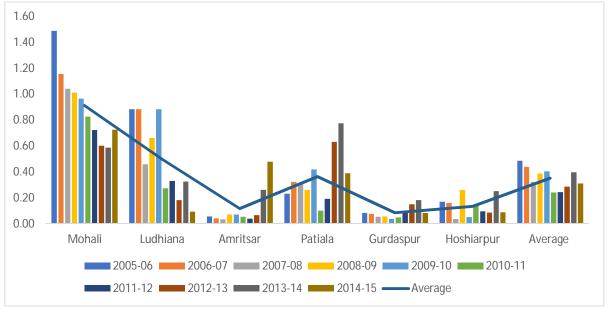


Figure 3: Average Quick Ratio of Selected Cooperative Milk Plants

For statistically analyzing the variance in the average quick ratios among the selected six cooperative milk plants, one-way ANOVA has been applied and between the milk plants of higher, medium and least turnover under study, independent t-test has been applied on the annual average quick ratios of all the milk plants. For this purpose, the following null hypothesis has been framed.

Ho: There is no significant difference in the quick ratio of selected cooperative milk plants.

H₁: There is significant difference in the quick ratio of selected cooperative milk plants.

The results presented in table 5 indicated that there has been significant difference in the quick ratio among the six milk plants under study (p<0.050) at 5% significance level. As a result, the null hypothesis has been rejected [12]. So, it has been proved that there was significant difference in the quick ratio of all the six milk plants.

Table 5: Statistical analysis of Quick Ratio of Selected Cooperative Milk Plants using One-Way ANOVA & t-test

	One-V	Way ANOVA				
	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	5.082	5	1.016	25.221	.000	
Within Groups	2.176	54	.040	23.221	.000	
Total	7.259	59				
	Independ	ent Sample t-test				
		Highest Turnov	er Milk Plants			
	t		df	S	Sig.	
	3.189		18		198	
Equal Variance Assumed		Medium Turnov	er Milk Plants		Sig. 498	
	-5.467		18	8.	310	
		Least Turnove	r Milk Plants			
	-1.782		18	.0)74	

But in case of Highest Turnover, Medium Turnover and Least Turnover milk plants the p-value has not found to be significant (p>0.050). So, in this case the null hypothesis has been accepted. Hence it has been proved that there was no significant difference in the quick ratio of Highest Turnover, Medium Turnover and Least Turnover milk plants.

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E. Average Absolute Quick Ratio of Selected Cooperative Milk Plants

The results shown in the table 6, depict that the average absolute quick ratio for all the selected six cooperative milk plants under study was less than the norms. It was fulfilling the norms during the years 2005-06 to 2007-08 and 2009-10, 2010-11 only in milk plant Mohali, on an average also it was as per norms in this milk plant. But in all the other milk plants it was less than the norms. It was 0.15 in Patiala, 0.13 on in Ludhiana, 0.04 in Hoshiarpur and 0.03 in case of Amritsar and Gurdaspur both during the period of study. This pattern has been further clarified in figure:4. The pattern of average absolute quick ratio was different among the six milk plants. It ranges between the lowest 0.03 in the milk plants Amritsar and Gurdaspur to highest 0.50 in milk plant Mohali. (Fig.4)

	Table 6. Average Absolute Quick Ratio of Science Cooperative With Hairts						
Year	Mohali	Ludhiana	Amritsar	Patiala	Gurdaspur	Hoshiarpur	Average
2005-06	0.63	0.09	0.01	0.04	0.02	0.02	0.13
2006-07	0.50	0.11	0.02	0.05	0.03	0.01	0.12
2007-08	0.61	0.11	0.01	0.11	0.03	0.01	0.15
2008-09	0.49	0.12	0.01	0.09	0.03	0.02	0.13
2009-10	0.71	0.15	0.02	0.02	0.02	0.03	0.16
2010-11	0.57	0.16	0.02	0.04	0.01	0.05	0.14
2011-12	0.48	0.18	0.01	0.08	0.02	0.02	0.13
2012-13	0.27	0.15	0.01	0.50	0.01	0.02	0.16
2013-14	0.34	0.18	0.18	0.50	0.15	0.21	0.26
2014-15	0.40	0.07	0.07	0.06	0.01	0.06	0.11
Average	0.50	0.13	0.03	0.15	0.03	0.04	0.15

Table 6: Average Absolute Quick Ratio of Selected Cooperative Milk Plants

Source: Annual Reports of Selected Cooperative Milk Plants 2005-06 to 2014-15

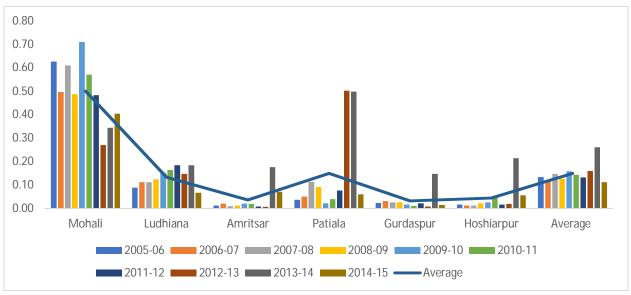


Figure 4: Average Absolute Quick Ratio Selected Cooperative Milk Plants

For statistically analyzing the variance in the average absolute quick ratios among the selected six cooperative milk plants, one-way ANOVA has been applied and between the milk plants of higher, medium and least turnover under study, independent t-test has been applied on the annual average absolute quick ratios of all the milk plants. For this purpose, the following null hypothesis has been framed.

Ho: There is no significant difference in the absolute quick ratio of selected cooperative milk plants.

 H_1 : There is significant difference in the absolute quick ratio of selected cooperative milk plants.



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The results presented in table 7 indicated that there has been significant difference in the absolute quick ratio among the six cooperative milk plants under study (p<0.050) at 5% significance level. As a result, the null hypothesis has been rejected [12]. So, it has been proved that there was significant difference in the absolute quick ratio of all the six milk plants.

But in case of Highest Turnover, Medium Turnover and Least Turnover milk plants the p-value has not found to be significant (p>0.050). So, in this case the null hypothesis has been accepted. Hence it has been proved that there was no significant difference in the absolute quick ratio of Highest Turnover, Medium Turnover and Least Turnover milk plants.

Table 7: Statistical analysis of Absolute Quick Ratio of Selected Cooperative Milk Plants using One-Way ANOVA & t-test

	(One-Way ANOV	A			
	Sum of Squares	df	Mean Square	F	Sig.	
Between Groups	1.605 5		.321	30.494	.000	
Within Groups	.569	54	.011			
Total	2.174	59				
<u>.</u>	Inde	pendent Sample t	-test			
	Highest Turnover Milk Plants					
	t		df		Sig.	
	8.234		18		.013	
Equal Variance Assumed	Medium Turnover Milk Plants					
Assumed	-1.838		18		.013	
	Least Turnover Milk Plants					
	517		18		.461	

F. Findings

It has been observed that the overall liquidity position of the selected cooperative milk plants was not satisfactory during the relevant period of study. The average net working capital of all the six milk plants was negative during the relevant period of study. It was positive in case of highest turnover milk plants, but it was negative in medium and least turnover milk plants. Further on analysing the liquidity ratios of these milk plants, it has been observed that the average current ratio was less than the norms. It was as per the norms in highest turnover milk plants for some years under study, but during the remaining period it was less than 2. It was more than 2 in milk plant Mohali during the period 2005-06 & 2006-07 and it was more than 2 in milk plant Ludhiana for three years i.e. 2005-06,2006-07 and 2008-09. But in case of medium turnover and least turnover milk plants it was less than the norms. Average quick ratio for all the six milk plants under study was less than the norms. It was more than 1 in Mohali in 2005-06 to 2008-09 but during the remaining years under study, it was less than the norms. On an average it was 0.91 for Mohali & 0.50 for Ludhiana. But in all the other milk plants it was even less than 0.50. Average absolute quick ratio for all the six milk plants under study was also less than the norms. It was fulfilling the norms during the years 2005-06 to 2007-08 and 2009-10, 2010-11 only in milk plant Mohali and on an average also it was as per norms in this milk plant. But in all the other milk plants it was less than the norms.

VI. CONCLUSION

It can be concluded from the study that the liquidity position of the selected six milk plants under study was not up to mark during the relevant period of study. The average net working capital was negative during the relevant period of study. It was positive in highest turnover milk plants, but the negative results of medium and least turnover milk plants had converted the average net working capital to be negative. Further the position depicted by the liquidity ratios was also not satisfactory. Average current ratio was less than the norms except in case of highest turnover milk plants. Similarly, average quick ratio and average absolute quick were showing unsatisfactory results below the set standards. It has been noted that on an average the liquidity position of medium and least turnover milk plants had been continuously unsatisfactory during the relevant period of study. It had been difficult for these milk plants to meet their short-term obligations in time. So, steps should be taken to manage their current obligations properly to the meet the competition and for the survival of these cooperative milk plants.



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