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### Do Women Trainees Tend to Satisfy their Prioritized Training Needs during the Training, and to What Extent?

Diab, A. M.<sup>1\*</sup> and M. Yacoub<sup>2</sup>

<sup>1</sup> Department of Rural Sociology and Agricultural Extension, Faculty of Agriculture, New Valley University, Egypt.

<sup>2</sup> High Institute for Agricultural Cooperation (HIAC), Ministry of Higher Education, Egypt.

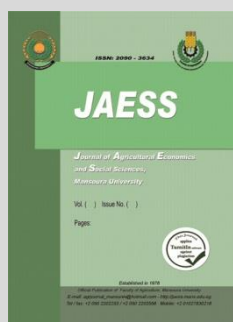


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#### ABSTRACT

A training program on manufacturing of dairy products was take place in Faculty of Agriculture, New Valley University targeting rural women leaders. The research goal is to determine whether the trainees (of rural women leaders in the New Valley Governorate) tend to satisfy their prioritized training needs during the training or not, and to what extent? Through the following objectives: 1) Assessing training needs of respondents using Delta N method, 2) Determining the learning index of the training program on trainees' knowledge, 3) Investigating the ex-post differences on trainees' knowledge, and 4) Determining the correlation between ranks of the training needs and their learning index. Data were collected from the 27 trainees using questionnaire form during 12 and 15 March 2018. Delta N was used for ranking the training needs of respondents before the training. Mean, standard deviation, percentages, learning index, paired sample differences, Kendall & Spearman rank correlation coefficients were used for data analysis and presentation. Findings indicated the positive change of trainees' knowledge by 10.41 mean score (26.03% of the total score). Considerable proportion of respondents (74.07%) has moderate level of learning index. Findings of "t" values referred to significant differences of trainees' knowledge caused by training. Finally, the application of Kendall and Spearman rank correlation coefficients between values of Delta-N and learning index has indicates a positive correlation coefficient of 0.714 and 0.810, respectively. This finding confirms that the trainees tend to satisfy their prioritized training needs during the training with very acceptable extend.

**Keywords:** Rural women leaders; training needs; needs assessment; Delta N method; New Valley; Egypt



#### INTRODUCTION

The agriculture sector plays a critical role in the Egyptian economy with a growth rate estimated at 3.2 % and contributes to 14.5 percent of GDP and employs 25.6% of all jobs (CAPMAS, 2018). Agriculture employs almost 45 % of all women in the workforce (USAID, 2017).

The contribution of women to national development in the current context and its potential is of greater significance (Diab & Diab, 2016). Women play a significant and crucial role in agricultural development and allied fields like dairy farming which is the major occupation of rural women in rural Egypt. The success in family-based dairy manufacturing has been attributed to a number of factors, one of which has been appropriate and/or effective training for rural women (Diab & Elsabbagh, 2017).

Training has been defined in various ways, including the following: it is a planned process to modify attitude, knowledge or skill behavior through a learning experience to achieve effective performance in any activity or range of activities (Manpower Services Commission, U.K., 1981). Training endeavors to impart knowledge, skills and attitudes necessary to perform job-related tasks (Truelove, 1992). Training is the process of acquiring specific skills for a particular purpose, it helps people to become qualified and proficient in doing some jobs (Abdul Halim & Ali, 1997).

Training is essential to achieve the required knowledge, skills and attitudes to accomplish jobs more efficiently; given that training is the procedure for assisting

the trainees to gain further knowledge, skills, attitudes and values related to the performance of their work (Tulsian & Pandey, 2009).

Training is a circular process that begins with needs identification and after a number of steps ends with evaluation of the training activity. A need is described as a discrepancy or gap between "what is", or the present state of affairs in regard to the group and situation of interest, and "what should be", or desired state of affairs (Borish, 1980). The needs identification process assists trainers in making sure that they have matched a training program to a training need (Abdul Halim & Ali, 1997).

There are several approaches for training needs assessment, the most important ones are (Abdel-Maksoud, 2010): 1) Assessment of knowledge and skills; and competence or ability, 2) Assessment of the degree of importance, 3) Assessment of the discrepancy between importance and knowledge or competency, 4) A 2 x 2 low-high importance / knowledge or competency matrix, (5) Borich model, and (6) Delta N method.

A training program on manufacturing of dairy products was take place in Faculty of Agriculture, New Valley University targeting rural women during 12-15 March 2018, the training curriculum consists of eight modules namely:

1. Dairy Cattle Care: including recommendations to good husbandry of cattle bred for the ability to produce large quantities of milk, from which dairy products are made.

\* Corresponding author.

E-mail address: [diabdr@yaho.com](mailto:diabdr@yaho.com)

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2. Yogurt [in Arabic pronounced *Zabady*]: is a food produced by bacterial fermentation of milk. To produce yogurt, milk is first heated, usually to about 85 °C (185 °F), to denature the milk proteins so that they do not form curds. After heating, the milk is allowed to cool to about 45 °C (113 °F). The bacterial culture is mixed in, and that temperature of 45 °C is maintained for 4 to 12 hours to allow fermentation to occur.
3. Yogurt-Based Drink [in Arabic pronounced *Mashroub Zabady*]: A drink prepared from yogurt by adding water, fruit, sweeteners or salt, has a slight salty or sugary taste.
4. Cottage Cheese [in Arabic pronounced *Gebna Qareesh*]: A type of white, soft, lactic cheese made from curdled skim milk [in Arabic pronounced *Laban Rayeb*].
5. Egyptian Cheese [in Arabic pronounced *Gebna Domiati*]: A soft white cheese usually made from cow or buffalo milk. It is salted, heated, coagulated using rennet and then ladled into wooden molds where the whey is drained away for three days. The cheese may be eaten fresh or stored in salted whey for up to eight months, then matured in brine.
6. Double Cream Cheese: it is made from milk with at least 60% butterfat in it. This is achieved by adding cream to the milk before the milk is curdled to form the curd.
7. Rumi Cheese [in Arabic pronounced *Gebna Rumi*]: a hard, bacterially ripened variety of cheese. It belongs to the same family as *Pecorino Romano* and *Manchego*. It is salty, with a crumbly texture, and is sold at different stages of aging.
8. Ice cream: is a sweetened frozen food typically eaten as a snack or dessert. It may be made from dairy milk or cream and is flavored with a sweetener, either sugar or an alternative, and any spice, such as cocoa or vanilla. Colourings are usually added, in addition to stabilizers.

The training program was sponsored by the project of "Agricultural Advisory Services: an approach to achieve food security in Egypt" which supported by Cairo University, managed by Faculty of Agriculture, Cairo University and implemented by Faculty of Agriculture, New Valley University.

The main purpose of this research is to determine whether the trainees tend to satisfy their prioritized training needs during the training or not, and to what extent? Through achieving the following objectives:

1. Assessment of the training needs of rural women in the New Valley Governorate in the field of dairy products manufacturing using Delta N method.
2. Determination of the learning index of a training program in the field of manufacturing dairy products on the knowledge of trainees
3. Investigation of the differences on knowledge before and after attendance the training program among the trainees
4. Determination the correlation between the ranks of the trainees' training needs and their learning index.

**Methodology**

A training program on manufacturing of dairy products was conducted during 12-15 March 2018 targeting twenty-seven rural women leaders in the New Valley governorate (All of respondents are local leaders with secondary technical education or more, holds cattle, and highly motivation to learn, moreover they were form Kharga and Paris districts), Egypt. Data were collected from trainees using an ex-post facilitator-made knowledge test. Mean, mode, standard deviation, range, frequencies,

percentages, Learning Index, paired sample differences, Kendall and Spearman rank correlation coefficients were used for data analysis and presentation.

Two approaches were used to assess respondents' knowledge on the studied items, first is subjective approach based on self-assessment for perceived relevance or importance of an item and perceived level of knowledge or competence concerning that item, second, is objective approach based on ex-post consultant-made knowledge test a. Subjective approach: In order to apply Delta N equation, respondents were asked to determine their answer on a five-point scale according to perceived relevance or importance of an item and perceived level of knowledge or competence concerning that item. Scores of Delta N was calculated by the following equation (Misanchuk, 1984):

$$\text{Delta N} = 1 - \frac{\sum_{i=1}^R \sum_{j=1}^C W_{ij} P_{ij}}{\sum_{i=1}^R \sum_{j=1}^C W_{ij} P_i P_j}$$

- Ri: Refers to rows from i = 1 to 5,
- Cj: Refers to columns from j = 1 to 5,
- Wij: The error weight for cell (i,j),
- Pij: The probability of a randomly sampled observation falling into cell (i,j),
- Pi and Pj: The expected marginal probabilities for rows (Ri) and columns (Cj) respectively.

b. Objective approach: In order to measure the trainees' level of learning due to the training, respondents were asked to answer on forty (true/false) statements. Responses were classified into three categories namely low, medium and high knowledge with values of 0-2, 3, and 4-5, for each item, respectively. Concerning the total package, values of categories were 0-13, 14-26, and 27-40, respectively.

In order to calculate the trainees' learning index, the following formula was used (Diab, 2015).

$$\text{Learning Index} = \frac{(\text{post-training scores} \% - \text{pre-training scores} \%)}{(100 - \text{pre-training scores} \%)} \times 100$$

**RESULTS AND DISCUSSION**

**1. The training needs of rural women in the New Valley Governorate in the field of dairy products manufacturing using Delta N method (Subjective approach).**

Based on the distribution of respondents according to their perception of the importance and level of knowledge of each skill, training needs are computed using Delta N method. Results show that Dairy Cattle Care, Manufacture of Quraish cheese, Yogurt, Ice cream, Yogurt-based drink, Double cream cheese, Domiati cheese, and Rumi cheese appear to be the ranked skills that need training (Table 1).

**Table 1. Results of the application of Delta N method to assess training needs for rural women in New Valley governorate, Egypt in the Area of manufacturing dairy products.**

No.	Item	Delta N*	Rank
1.	Dairy Cattle Care	0.7353	1
2.	Manufacturing of Yogurt	0.3192	3
3.	Manufacture of Yogurt Drink	0.1408	5
4.	Manufacture of Qareesh Cheese	0.3987	2
5.	Manufacture of Domiati Cheese	0.1167	7
6.	Manufacture of Double Cream Cheese	0.1172	6
7.	Manufacture of Rumi Cheese	0.1125	8
8.	Manufacture of Ice Cream	0.1698	4

Source: the study's findings

\*The greater these values are, the greater the training needs are.

**2. Learning index of a training program in the field of manufacturing dairy products on the knowledge of trainees (Objective approach).**

Respondents' knowledge mean scores of each item of manufacturing dairy products are presented in table 2.

The mean score of the respondents' knowledge about the studied package has increased from 21.33 before the attendance the training which is 53.3% of the maximum

score (40) to 31.74 after the attendance of the training which is 79.35% of the same maximum score. This indicates positive change of trainees' knowledge level by 10.41 mean score (26.03% of the total score). The results also show that the mean scores of each item of the studied package were raised as a reason of respondents' attendance of learning modules of training program.

**Table 2. Respondents' knowledge on Manufacturing of dairy products before and after attendance of the training.**

Item	Before (%)			After (%)			Max. Score	Before (Mean)		After (Mean)		Differences	
	Low	Medium	High	Low	Medium	High		Value	%	Value	%	Value	%
Dairy Cattle Care	7.41	25.93	66.67	0.00	0.00	100	5	3.59	71.8	4.78	95.6	1.19	23.80
Manufacturing of Yogurt	18.52	40.74	40.74	0.00	14.81	85.19	5	3.11	62.2	4.19	83.8	1.08	21.60
Yogurt Drink	7.41	51.85	40.74	0.00	25.93	74.07	5	3.33	66.6	4.22	84.4	0.89	17.80
Qareesh Cheese	33.33	37.04	29.63	0.00	14.81	85.19	5	2.93	58.6	4.37	87.4	1.44	28.80
Domiaty Cheese	40.74	44.44	14.81	11.11	18.52	70.37	5	2.63	52.6	3.93	78.6	1.30	26.00
Double Cream Cheese	77.78	18.52	3.70	18.52	59.26	22.22	5	1.63	32.6	3.07	61.4	1.44	28.80
Rumi Cheese	74.07	3.70	22.22	37.04	29.63	33.33	5	1.78	35.6	2.96	59.2	1.18	23.60
Ice Cream	59.26	14.81	25.93	7.41	3.70	88.89	5	2.33	46.6	4.22	84.4	1.89	37.80
Total package	7.41	77.78	14.81	0.00	3.70	96.30	40	21.33	53.325	31.74	79.35	10.41	26.03

Source: the study's findings

Results in table 3 show the frequencies and percentages distribution of respondents regarding their learning indexes of items of the dairy products package. Findings revealed that the "Dairy Cattle Care" has the highest learning index of 82.1% followed by "Manufacture of Quraish cheese- Soft Cheese" (73.8%) and "Manufacture of ice cream" (72.3%). On the other hand, findings show that "Manufacture of Rumi cheese" gain the lowest score of learning index with score of 28.8% followed by "

Manufacture of double cream cheese" (36.6%) and "Manufacture of yogurt" (49.1%)

With regard to the total score of the studied package, the mean scores reached about 54.03, with standard deviations 12.43. Considerable proportion of the respondents (74.07%) has moderate level of learning index of the package. Whereas near one fifth (18.52%) of respondents have high level of learning index and the remaining percentage 7.41% had low level of learning index.

**Table 3. Distribution of respondents by their learning index**

Item	Range		Mean	S.D.	Level of learning index (%)		
	Min.	Max.			Low (0-33.3)	Medium (33.34-66.66)	High (66.67- 100)
Dairy Cattle Care	0	100	82.10	36.67	14.81	3.70	81.48
Manufacturing of Yogurt	0	100	49.07	43.26	40.74	18.52	40.74
Manufacture of Yogurt Drink	0	100	59.88	42.93	33.33	18.52	48.15
Manufacture of Qareesh Cheese	0	100	73.77	32.42	18.52	11.11	70.37
Manufacture of Domiaty Cheese	0	100	56.48	40.12	33.33	14.81	51.85
Manufacture of Double Cream Cheese	0	100	36.60	28.65	51.85	37.04	11.11
Manufacture of Rumi Cheese	0	75	28.77	26.04	59.26	33.33	7.41
Manufacture of Ice Cream	0	100	72.28	30.66	14.81	11.11	74.07
Total	33.33	79.17	54.03	12.43	7.41	74.07	18.52

Source: the study's findings

**1. The differences on knowledge before and after attendance the training program among the trainees**

In order to investigate the differences on respondents' knowledge resulting from the training courses, paired sample correlation and "t" test were done as shown in table 4. Results show that there are significant correlations at 0.01 level of probability between respondents' knowledge

before and after training attendance for all items except Dairy Cattle Care, Manufacturing of yogurt & double cream cheese. While "t" values referred to significant differences of respondents' knowledge caused by their attendance of the training course, which reflected the effectiveness of the trainings on raising respondents' knowledge.

**Table 4. Results of paired sample correlation and "t" test for respondents' knowledge on manufacturing dairy products before and after attendance the training**

No.	Variables	Paired Differences			Correlation	"t"
		Mean	Std. Deviation	Std. Error Mean		
1.	Dairy Cattle Care	1.185	0.736	0.142	0.079	8.370**
2.	Manufacturing of Yogurt	1.074	1.207	0.232	0.025	4.626**
3.	Manufacture of Yogurt Drink	0.889	0.641	0.123	0.659**	7.211**
4.	Manufacture of Qareesh Cheese	1.444	0.751	0.145	0.578**	9.993**
5.	Manufacture of Domiaty Cheese	1.296	1.031	0.198	0.404**	6.534**
6.	Manufacture of Double Cream Cheese	1.444	1.311	0.252	0.080	5.726**
7.	Manufacture of Rumi Cheese	1.185	1.145	0.220	0.594**	5.380**
8.	Manufacture of Ice Cream	1.889	1.219	0.235	0.393**	8.048**
Total	Manufacture of dairy products	10.407	4.560	0.877	0.356*	11.861**

Source: the study's findings

\* Significant at 0.05 level

\*\* Significant at 0.01 level

## 2. The correlation between the ranks of the trainees' training needs and their learning indices.

The application of Kendall and Spearman rank correlation coefficients between the values of Delta N method and the valued of learning index has resulted in a positive correlation coefficient of 0.714 and 0.810, respectively. This finding confirm that the trainees tend to satisfy their prioritized training needs during the training with very acceptable extend.

## CONCLUSION

Based on the obtained findings it could be concluded that the trainees tend to satisfy their prioritized training needs during the training with very acceptable extend. The study recommend that training needs identification is very important phase of training, so the trainers knew how to put the curriculum of the training to fill the training gaps.

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## هل يميلن المتدربات إلى تلبية احتياجاتهن التدريبية ذات الأولوية أثناء التدريب؟ وإلى أي مدى؟

أحمد محمد دياب<sup>1</sup> و محمد يعقوب<sup>2</sup>

<sup>1</sup> قسم المجتمع الريفي والإرشاد الزراعي، كلية الزراعة، جامعة الوادي الجديد، الوادي الجديد، مصر

<sup>2</sup> المعهد العالي للتعاون الزراعي، وزارة التعليم العالي والبحث العلمي، القاهرة، مصر

لقد تم تنفيذ برنامج تدريبي للرائدات الريفيات حول تصنيع منتجات الألبان في كلية الزراعة جامعة الوادي الجديد. ويستهدف هذا البحث تحديد ما إذا كانت المتدربات من الرائدات الريفيات يميلن إلى تلبية احتياجاتهن التدريبية ذات الأولوية أثناء التدريب أم لا، وإلى أي مدى؟ وذلك من خلال تحقيق الأهداف التالية: (1) تقييم الاحتياجات التدريبية للمبحوثات من الرائدات الريفيات باستخدام طريقة Delta N، (2) تحديد دليل التعلم للمتدربات نتيحة للبرنامج التدريبي (3) دراسة الاختلافات في المعرفة قبل التدريب وبعده، و (4) تحديد العلاقة بين رتب الاحتياجات التدريبية ومؤشر التعلم. وقد تم جمع البيانات من 27 متدربة باستخدام إستمارة الإستمبيان خلال 12 و15 مارس 2018. وقد تم استخدام Delta N لترتيب الاحتياجات التدريبية للمبحوثات فيما يتعلق بتصنيع منتجات الألبان قبل التدريب، وتم استخدام المتوسطات الحسابي والانحراف المعياري والنسب المئوية ودليل التعلم واختبارات الفروق بين أزواج العينات ومعاملات ارتباط الرتب لكيندال وسبيرمان لتحليل وعرض البيانات. وتشير نتائج الدراسة إلى التغير الإيجابي في مستوى معرفة المتدربات بمتوسط قدره 10.41 درجة (26.03% من إجمالي الدرجة)، كما تشير النتائج إلى أن غالبية المبحوثات (74.07%) قد وقعن في المستوى المتوسط من دليل التعلم الخاص بالحزمة المدروسة. كما تشير النتائج الخاصة بالفروق بين المتوسطات (إختبار "ت") إلى معنوية الفروق في درجات معارف المبحوثات نتيحة لحضورهن للبرنامج التدريبي. وأخيراً، تشير النتائج المتعلقة بمعاملات ارتباط الرتب بين كل من Delta-N ودليل التعلم إلى وجود ارتباط موجب بدرجة معنوية، حيث بلغت قيم معاملات ارتباط كندال وسبيرمان نحو 0.714 و0.810 لكل منهما على الترتيب، وتؤكد هذه النتيجة أن المتدربات يميلن إلى تلبية احتياجاتهن التدريبية ذات الأولوية خلال التدريب وإلى مدى مقبول للغاية.

**الكلمات الدالة:** الرائدات الريفيات؛ الاحتياجات التدريبية؛ تقدير الاحتياجات؛ طريقة Delta N؛ الوادي الجديد؛ مصر