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The Adoption of Sheep Raiser's to Veterinary Vaccines at Matrouh District, Matrouh Governorate

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ABSTRACT

The study aimed to investigate the adoption of Veterinary Vaccines Technique (VVT) among Sheep Raiser's (SR) of Matrouh Governorate. This study was carried out in Matrouh Governorate. A simple random sample of 282 respondents was selected from SR's lists representing (26.0%). Four villages were selected for this study as follow: El-grawla, Sedi henash, El-zayat, El- halazeen, whereas numbers of respondents were 96, 78, 77, and 31 respectively. Frequency, percentage, and mean, were used for descriptive purposes. The Pearson correlation coefficient was employed to explore the relationship between the personal characteristics of SR and the adoption of VVT. Step-wise regression was utilized to determine the contribution ratio of each independent variable in explaining the determination coefficient of the adoption of VVT. All statistics were carried out using SPSS package. Results showed the respondents distribution among the adoption phases as follows: (95.8%) of the total respondents are located in the awareness stage, (95.8%) in the interest stage, (86.5%) in the evaluation stage, (79.2%) in the trial stage, (75.0%) in the post-trial evaluation stage, while, (70.8%) of the study respondents adopted the improved idea under study. Finally, (63.8%) of the total respondents continues to practice VVT. The results showed positive and significant correlation between the SR adoption degree of VVT and the following variables: Size of the agricultural animal possession, Size of the sheep-animal agricultural possession, Formal social participation, Urban frequent visitations, Participation in extensional training programs, Motives for participating in developmental extension activities, and Frequent visitations of Districts that provide agricultural services.

Keywords: Adoption, Sheep Raisers, Veterinary Immunization.

INTRODUCTION

A growing global population and changing diets are driving up the demand for food. Production is struggling to keep up as crop yields level off in many parts of the world, ocean health declines, and natural resources—including soils, water, and biodiversity—are stretched dangerously thin. A 2020 report found that nearly 690 million people—or 8.9 percent of the global population—are hungry, up by nearly 60 million in five years. The food security challenge will only become more difficult, as the world will need to produce about 70 percent more food by 2050 to feed an estimated 9 billion people. The challenge is intensified by agriculture's extreme vulnerability to climate change. Climate change's negative impacts are already being felt, in the form of increasing temperatures, weather variability, shifting agroecosystem boundaries, invasive crops and pests, and more frequent extreme weather events. On farms, climate change is reducing crop yields, the nutritional quality of major cereals, and lowering livestock productivity. Substantial investments in adaptation will be required to maintain current yields and to achieve production and food quality increases to meet demand. (<https://www.worldbank.org/en/topic/climate-smart-agriculture>).

One method of agricultural development is "Climate Smart Agriculture (CSA)", which is an integrated approach to managing landscapes—cropland, livestock, forests and

fisheries—that addresses the interlinked challenges of food security and accelerating climate change. CSA aims to simultaneously achieve three outcomes: 1. Increased productivity: Produce more and better food to improve nutrition security and boost incomes, especially of 75 percent of the world's poor who live in rural areas and mainly rely on agriculture for their livelihoods. 2. Enhanced resilience: Reduce vulnerability to drought, pests, diseases and other climate-related risks and shocks; and improve capacity to adapt and grow in the face of longer-term stresses like shortened seasons and erratic weather patterns. 3. Reduced emissions: Pursue lower emissions for each calorie or kilo of food produced, avoid deforestation from agriculture and identify ways to absorb carbon out of the atmosphere. While built on existing knowledge, technologies, and principles of sustainable agriculture, CSA is distinct in several ways. First, it has an explicit focus on addressing climate change. Second, CSA systematically considers the synergies and tradeoffs that exist between productivity, adaptation and mitigation. Finally, CSA aims to capture new funding opportunities to close the deficit in investment. <https://www.worldbank.org/ar/topic/agriculture/overview#2>

The agricultural sector, especially livestock production, is affected by international economic and trade changes besides the effects of climate change as livestock sector is of paramount importance in contributing to achieving food security; despite the increasing growth of

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livestock sector in the Arab world, which is estimated at 2.3 % annually, both production and productivity remained below the latent potentials and available resources, and the region is still Arabia suffers from a nutritional gap in many of the main food commodities, especially red meat and dairy products.

Egypt faces in particular a large shortage in animal protein, as the local production of red meat is estimated at about 650 thousand tons and covers the rest of the needs by importing 365 thousand tons, with a self-sufficiency rate of 64 % with an average of 4.7 kg/year per capita of the local production of red meat, with an expected increase in the amount of imported red meat to 446 thousand tons annually, and a self-sufficiency rate decreased to 55% during 2018-2020. The report emphasized the low quantitative and qualitative production, and the spread of infectious and epidemic diseases with insufficient

Veterinary vaccines and dependence on importing fodders which led to raising production costs, in addition to the increase in the prices of production inputs (Central Agency for Public Mobilization and Statistics, 2017, besides the primitive and traditional cultures in raising sheep had specific convictions for the idea of veterinary Vaccines, where Bedouins believed that the disease is cured by the same disease, which is the primitive form of immunization in the treatment of some diseases, and the frames of reference for sheep treatments at the beginning of the twenty-first century relied on experienced people of trustworthy in breeding sheep within their Bedouin societies who were the pioneers in adopting the technique of veterinary immunization since there were in more contact and follow-up with the veterinarians at the veterinary units and the researchers in the research Districts (Gouda, 2019).

Livestock is the mainstay of the economy and individual incomes in the Bedouin communities in Matrouh Governorate as 80 % of the people work in grazing and raising livestock, the increasing number of farm animals i.e. sheep, goats, camels, livestock during the period from 1983-2018 a concrete evidence on the vitality of animal husbandry in the Government how extent the Bedouin families depended on it as a source of income and food supply of animal protein as meat and dairy products, since raising sheep and goats lead the animal production with 446502 heads since sheep heads of 342506, 10399 heads for goats, 15644 heads for camels, 9284 heads for cows and buffalos (Agricultural Directorate, Matrouh, 2019). The open pastoral system prevails, where the herds are grazing around looking for water sources and then migrate to another place and so on, and the herds move in the form of large gatherings and in semi-defined and known paths. Raising in such system depends on the expertise of shepherds or passed down from parents or ancestors, animals are roaming and grazing around in an instable system with the shepherds, such system is efficient due to the low inputs versus the outputs, although it has some problems in terms of lack of records on the actual production of animals under such system, in accurate animal survey, the inefficient extension supervision, offering the technical advice, the difficult veterinary health care services offered, the difficult application of the recent bio-technologies or offering the necessary technological packages for developing production in quantity and quality and the difficulty of making human

development plans for such huge sector (Saleh, Berkawi et al, 2006, pp. 22-24).

Changing the behavior of Bedouin Raisers is an essential element in the process of developing, modernizing and upgrading Bedouin societies. To achieve that, the state is interested in programs for directed change including agricultural extension programs aimed at spreading innovations in general and agricultural ones in particular.

Modernization of agricultural sector and agricultural environment depends on several factors, perhaps the most important of which is what is known as the widespread dissemination of agricultural and environmental technologies among farmers, the process of adopting these technologies by farmers involving the consequent optimum economic use of their resources and the advancement of their production rates and quality, as modern agriculture requires new technology that is compatible with Scientific knowledge about this farming. In many countries it is possible to obtain technologies that are higher than those actually applied, because the gap between the level of knowledge of available technology and that applied in a particular farming situation is not completely closed, and many of the and common technologies may not be appropriate for a particular society, or that assistive devices or Its publisher may be unavailable or unable to understand the social, economic and environmental reality in which it operates, or it may suddenly develop cultural resistance among the beneficiaries of these technologies.

In the light of what mentioned before, the research was conducted to study sheep breeder adoption of veterinary Vaccines in Matrouh Districts, Matrouh Governorate, as a guide study with its methodology and results in activating the process of adoption of such technologies in Matrouh Governorate and similar desert areas to their conditions.

2. Research Objectives

In line with the dimensions of the problem, the research aimed to study the adoption of Sheep Raiser's for Veterinary Vaccines Technique in Matrouh District, Matrouh Governorate, and this main goal will be achieved through the following sub-objectives:-

- 1- Identifying the phases of respondents' adoption of sheep Raisers to Veterinary Vaccines Technique in Matrouh District, Matrouh Governorate.
- 2- Identifying the relationship between the degree of sheep breeder's adoption of Veterinary Vaccines Technique in Matrouh District, Matrouh Governorate, and some of their studied personal characteristics.
- 3- Determining the degree of contribution of the studied personal characteristics of respondents to the total variance that explains the degree of sheep breeder adoption of Veterinary Vaccines Technique in Matrouh District, Matrouh Governorate.

3- Theoretical Framework:

The process of an individual's adoption of the new idea as seen by (Al-Adly, 1983, p.: 219-221), is an integrated process that passes through a series of phases, and dividing the adoption process into phases is an industrial division for the purpose of clarifying the idea in the minds, and the phases were included in the adoption process was divided into five phases: awareness, recognition or attention to the idea, interest stage, evaluation stage, experimentation stage, and adoption stage.

(Abdul-Maqsoud, 1988, pg.: 188-195) indicated that the conception of the adoption process was marred by many shortcomings for many reasons i.e. the process according to this conception always ends with adoption decisions, while rejection and non-acceptance may happens practically besides a possible outcome for the decision-making process, and then it is necessary to search for a more comprehensive concept than the concept of "adopting process" that includes both acceptance and rejection, as well as that the mentioned five phases do not always occur in the same order, and also

that some of these phases may not occur, especially the experimental phase. Also, the evaluation takes place in all phases of adoption and is not an independent phase in itself. Also, in the decision-making process, certain information must be available to confirm the decision that was made concerning the idea. After a period of adoption, the individual may make a decision to reject the experience or not to continue using it. The sources of information can be arranged in order of importance for each phase of the adoption process, as shown in the following form:-

Phases of the adoption process				
Awareness	Attention	Evaluation	Experiment	Adoption
Hearing about the idea or the new experience	Interest in getting more information on the idea	Weighing information on making decision	Experimenting the idea of the experience on a small scale	Accepting the idea and get convinced and continue to use it
1- means of mass media	1- means of mass media	1- friends and neighbors	1- friends and neighbors	1- friends and neighbors
2- friends and neighbors	2- friends and neighbors	2- agricultural institutions	2- agricultural institutions	2- agricultural institutions
3- agricultural institutions	3- agricultural institutions	3- agricultural inputs dealers	3- agricultural inputs dealers	3 means of mass media
4- agricultural inputs dealers	4- agricultural inputs dealers	4- means of mass media	4- means of mass media	4- agricultural inputs dealers

Figure 1. importance of information sources for each phase of adoption

(Fliegel, 1984, pp: 77- 80) thinks that the circumstances that make farmers' decisions on adopting agricultural innovations are represented in social and natural circumstances besides the infrastructure framework inside the local society, since the social fabric is an essential source for the information that make the decision on adopting the agricultural innovations and the effective extensional connection doesn't require large knowledge on the complicated relations between means and ends which are the relationship that affect the decision, rather it necessitates taking advantage of the ability of the social fabric to transfer information and minimize the negative consequences of the factors that hinder the flow of information.

With regard to the natural conditions of agriculture, it is obvious that the land resources vary in their quality, and there is also variation in climatic conditions around the year, so, the extent of providing information related to this discrepancy is considered of great importance because it determines the options available to the implementers of the decision.

The current study has relied on six hubs to adopt sheep Raisers for veterinary immunizations in Matrouh District, Matrouh Governorate, which are:

- 1- The phase of awareness and attention (hearing about the novelty).
- 2-The phase of interest in the idea.
- 3- The stage of mental evaluation of the technology.
- 4- The phase of testing the new idea.
- 5-The evaluation phase after the experiment.
- 6- Adoption phase

Veterinary immunizations and their importance for farm animals:

Types of veterinary Vaccines:

Vaccine: a biological substance intended to create a specific immunity in the body, which is given a specific amount of it. As for live weakened or dead germs, immunity is formed in the body after approximately 10-15 days. The vaccine is given to healthy animals only. As for sick or suspected infected animals, they are injected with serums that contain ready-made antibodies, and immunity is formed immediately, but it does not last long.

Serum: antibodies that are prepared to confront pathogens in the body.

Features of the ideal vaccine:

To be safe and not lead to infection, to activate the immune system, to give immunity equal to or greater than natural immunity as a result of infection, to facilitate the distinction between natural infection and immunity resulting from giving the vaccine, has no side effects, is easy to use, save, store and transport.

Conditions to be followed when immunizing:

1- Conditions for the vaccine:

- Purchasing the vaccine from a trusted source accompanied by a calibration certificate stating its validity.
- Follow the instructions for immunization from the methods of transferring, preserving, giving and terminating the immunization in a timely manner before the expiration date.
- The dried vaccines must be kept tightly closed, away from light and well stored until the time of use as described by the producing company.
- Not to use the vaccines after the expiry of their expiry date written on the package, regardless of the quality and accuracy of storage.
- Vaccines containing adjuvants should not be frozen in suspension.
- The injection solution must be sterile or use a physiological saline solution.
- Needles used in live vaccines should not be sterilized with any disinfectants and sterile needles should be used.
- Packages should be thrown away after use and not stored or reused.

2- General conditions for the success of the Vaccines process:

- Nutrition, proper ventilation and control of stressful environmental factors in the farm (high temperature - cold - air currents – crowding).
- The need to clean the buildings before immunization.
- The animal must be healthy and of appropriate age.
- Excluding the animal that is infected or suffering from malnutrition, severe parasitic infestation, and poor health, in which case Vaccines is postponed until an appropriate time.
- Excluding the females in the last weeks of pregnancy.

-Commitment to the dates and doses specified for the initial and booster immunizations.

Procedures to be followed during immunization:

- It is necessary to supervise the veterinary process of immunization.
- Do not open bottles or ampoules containing the vaccine or serum unless immediately after use so as not to be exposed to contamination and spoilage.
- Two vaccines should not be mixed together.
- Determine the appropriate dose for the animal according to the instructions.

Immunization errors:

- 1- Using antibiotics in violation of technical principles leads to negative effects on the animal and the efficiency of the vaccine.
- 2- Vaccines of animals without others from the same herd.

The most important immunizations used for sheep are: anaerobes (8 diseases), sheep pox, rift valley fever, pasteurilla (septicemia), peste des petits ruminants (PPR). Therefore, Vaccines is an essential means to preserve the animal's life and protect it from endemic infectious diseases, which cause economic losses that affect the national economy. Therefore, it is necessary to stop and control the spread of these diseases.

Benefits of veterinary Vaccines:

- 1-Giving vaccinated animals immunity against the diseases against which they are vaccinated and protecting them from the dangers of infection, and this is a guarantee of preserving their health, survival, continuity of activity, and development of their production.
- 2- Protecting human health from infection with common diseases transmitted to it from infected animals, as Vaccines prevents the spread of disease foci, and public health becomes less vulnerable to infection.
- 3- Immunization is essential and important to protect animal production projects and achieve their economic success. This is clearly seen in animal and poultry breeding projects, where failure to implement Vaccines programs leads to pathological surprises.
- 4- Immunization is a practical and necessary contribution to the success of supply plans, because it secures the safety of animals and their products, and makes food sources and animal materials necessary for nutrition and the economy safe and available to consumers and to economic projects (industrial and commercial).
- 5- Immunization is much cheaper than the cost of treatment. (Al-Qattan, 2017, pg.: 1-2)

4-Methodology:

From the administrative standpoint, Matrouh District is considered one of the Districts of Matrouh Governorate. Matrouh District includes a number of main villages. Sheep Raisers in Matrouh District were identified with ten or more heads, according to the data of the Directorate of Agriculture in Matrouh Governorate 2019 Table No. (1), and the four largest were selected Villages in terms of the number of sheep Raisers who have ten or more sheep were as follows: Al-Jarawla village with 374 herders, then Sidi Hanish village with 299 herders, then Al-Zayyat village with 277 herders, then Al-Halazeen village with 115 Raisers, so the total sample for the four villages were 1065 Raisers.

Table 1. Comprehensive and sample of sheep Raisers in some selected villages in Matrouh District

Village	No of Raisers	Sample	Order
El Gerwala	374	96	1
Sidi Heneish	299	78	2
El zaiyat	277	77	3
El halzein	115	31	4
Total	1065	282	

Source: Districts for Information, Supporting and Making decision, Matrouh Governrate, 2019.

A simple random sample was taken from the four villages selected to implement the field study, according to the inventory of sheep Raisers with ten or more heads in Matrouh District through the Directorate of Agriculture in Matrouh Governorate, using Krijicie And Morgan equation to determine the sample size and by applying the previous equation, a simple randomized sample was chosen based on the statistics of the Department of statistics of the Directorate of Agriculture in Matrouh Governorate, the sample included 282 respondents, representing 26% of the respondent Raisers. They were distributed to the villages selected for the implementation of the study, with (96) Raisers in the village of (Al-Jarwala), and (78) educators in the village of (Sidi Hanish), and a number of (77) Raisers in the village of (Al-Zayyat), and (31) Raisers in the village of (Al-Hallazeen).

The field study data were collected during the period from August 2020 to October 2020 through personal interviews using a questionnaire form. The questionnaire was designed and pretested for achieving the study objectives. It included sets of questions to measure the study variables, as follows Part one : 1) Age: The age was measured by asking the respondent about his age to the nearest Gregorian year, 2) Educational level: measured by asking the respondent about his educational status and it was divided into six categories (illiterate, who reads and writes without obtaining a certificate, holds a primary certificate, holds a middle school certificate, and holds a diploma),3) The size of the agricultural animal possession: measured by asking the respondent about the number of heads of animals he held and converting them to the number of units and divided into three categories: low (they own less than 27 animal units), medium holding (27-51 animal units), and high holding (51 animal units or more), 4) The size of the sheep-animal agricultural possession: measured by asking the respondent about the number of sheep he held, and it was divided into three categories: low (less than 10 units), medium holding (10 - less than 24 units), and high holding (24 units or more), 5) Formal social participation: measured by asking the respondent about his membership in a number of social organizations in Matrouh District,6) Urban frequent visitations: measured by the respondents' frequency on the cities and surrounding places, 7) Participation in extensional training programs: measured by asking the respondent about the number of courses he participated in as training areas in animal production, plant production, harvesting water, and preserve the environment, 8) Motives for participating in developmental extension activities: measured by asking the respondent about the reason for participating in the development extension activities,9) Frequent visitations of Districts that provide agricultural services: measured by the frequency of the respondents on Districts that provide agricultural services, and 10) Farm animal modernization: measured by asking the respondent about his readiness for agricultural and animal modernization.

Part Two: The process of adopting veterinary immunization technology:

1- Phase of awareness and attention to the technology			
Item	No of question	Response	coding
Hearing about veterinary Vaccines	1/1		
Hearing		yes	2
Not hearing		no	1
Source of hearing about the technique	1/2	-Attending extensional meeting on the technology -Participating in a demonstration on the technology -Self-reading or was read by someone in extensional brochure on the technology	
Date of hearing about the technique	1/3		
2- Phase of interest to the studied technology			
Item	No of question	Response	coding
Interest to increase information on the technology	1/2	Interested Not interested	2 1
Information to know on the technology	2/2		1
Source of extra information to know about the technique	2/3		2 3
3- Phase of evaluation of the studied technology:			
item	No of question	Response	Coding
Phase of evaluating the technology	3/1	-Considered between yourself and your family/neighbors -considered by yourself -wanted to make sure from others -disregarded the idea -waited for others results -convinced by information known and tried it	Different steps were ordered based on respondent's response to get the sub-path inside the phase
Reasons not to experiment the technology	3/2		
4- Phase of experiment of the studied technology			
Item	No of question	response	Coding
Phase of experimenting the technology			Steps were ordered based on respondent's response
Reasons not to experiment the technology	4/2		
5- Phase of evaluating the technology after experiment			
item	No of question	Response	coding
Phase of evaluating of the technology after experiment	5/1	-Considered between yourself and your family/neighbors -calculated your experiment results by yourself -wanted to make sure from others -disregarded the idea -waited to see others' results	Steps were ordered based on respondent's response
Reasons not to apply the technology	5/3	Convinced of the idea and applied it	
6- Phase of adopting the studied technology			
item	No of question	Response	coding
Adopting the technology	6/1	-I vaccinate my own animals against the bacterial diseases -I vaccinate my own animals against the virus diseases -The animal is taken the proper vaccine dose based on the case -After finding out the benefits of Vaccines, I informed others	
Reasons not to continue to apply the technology	6/2		

Statistical hypotheses:

The first statistical hypothesis:

"There is no statistical relationship between the studied personal characteristics of respondents i.e. (Age, Educational level, Size of the agricultural animal possession, Size of the sheep-animal agricultural possession, Formal social participation, Urban frequent visitations, Participation in extensional training programs, Motives for participating in developmental extension activities, Frequent visitations of Districts that provide agricultural services, Farm animal modernization) and the degree of respondents' adoption to the technology of veterinary immunization for sheep in Matrouh District as a subordinate variable,"

The second statistical hypothesis:

"The studied personal characteristics of respondents i.e. (Age, Educational level, Size of the agricultural animal possession, Size of the sheep-animal agricultural possession, Formal social participation, Urban frequent visitations, Participation in extensional training programs, Motives for participating in developmental extension activities, Frequent visitations of Districts that provide agricultural services, Farm animal modernization) had no contribution in explaining the

total variation in the degree of respondents' adoption to the technology of veterinary immunization for sheep in Matrouh District as a subordinate variable,"

Tools of statistical analysis:

Several statistical tools and measures were used to describe the research variables and analyze the field data to meet the study objectives i.e. the Replicates, the Percentage to describe the social, economic, communicative and psychological characteristics of respondents in the study area, Person's Test was used to identify the relationship between the respondents' personal characteristics and the degree of adopting veterinary immunization, the Step-Wise model define the extent of contribution of each of the independent variables of significant correlation in explaining the total variation for the change in respondents' adoption to the veterinary immunization by means of Statistical program Package for Social Science SPSS.

Description of the study sample:

Table (2) shows the following: more than three quarters of respondents 77.0 % were under 50 years, is an age allow the agricultural extension more influential and effective environment to introduce all the innovations, around 30.9 % were illiterate, 28.0 % can read and write, 20.2 % had elementary education

level, 9.6 % had preparatory education level, 11.3 % had high school education level. The percentage of their possession (less than 15 animal units) reached 50.0%, and those with possession ranging from (15 to less than 35 animal units) 23.1%, and those who possessed 35 animal units or more were 26.9%, and the percentage of their possession (less than 10) sheep animal unit) 50.0%, while the percentage of those holding (10 - less than 24 units) was 26.6%, and those (24 sheep animal units or more) reached 23.4%, and the percentage of non-participating respondents was 79.8%, compared to 11.7% participation rate. The low formal social frequency, while the average participation rate was 5.7%, the high participation was 2.8%, the percentage of

those with a low urban frequency was 24.1%, the average was 45.7%, and the high was 30.2%, and it was found that three quarters of the respondents fall within the category of medium and high urban frequency 75.9%. The participation rate in the low extension training programs was about 74.1%, the average participation rate was about 23.0%, the high participation was about 2.8%, and the percentage of those with a degree of frequent visitations to the Districts that provide agricultural services was low 39.7%, the average was 34.8%, and the high was 25.5% , those with low modernization degree were 29.8, 37.9 % for the moderate and 32.3 % for the high modernization degree.

Table 2. Distribution of respondents according to their studied personal variables

variable	Replicates N=282	%	Variable	Replicates N= 282	%
1) Age			2) Education level		
Less 40	98	34.8	Illiterate	87	30.9
40 – less 50	119	42.2	Read & write	79	28.0
50 – less 60	19	6.7	Elementary	57	20.2
60 – less 70	30	10.6	Preparatory	27	9.6
Over 70	16	5.7	Secondary	32	11.3
Total	282	100		282	100
3) Size of animal holding			4) Size of sheep holding		
Less 27	141	50	Less 10	141	50
27-less 51	65	23.1	10- less 24	75	47.7
Over 51	76	26.9	Over 24	66	30.2
Total	282	100	Total	100	100
5) Formal social participation			6) Civil visitations		
No participation	225	79.8	Less than 8 degrees	68	24.6
Low participation	33	11.7	8-less 16	129	45.7
Moderate participation	16	5.7	Over 16	85	30.2
High participation	8	2.8	Total	282	100
Total	282	100			
7) participating in developmental extension activities			8) Frequent visitations of Districts that provide agricultural services		
Less 6	209	74.1	Less 9	112	39.7
6-less 9	65	23.1	9- less 13	98	34.8
Over 9	8	2.8	Over 13	72	25.5
Total	282	100	Total	282	100
9) Motives for participating in developmental extension activities			10) Farm animal modernization		
Low less 3 degree	132	46.8	Low less 22 degree	26	9.2
Moderate 3-less 5	70	24.8	Moderate 22-less 33	134	47.5
High over 5	80	28.4	High over 33	122	43.3
Total	282	100	Total	282	100

Source: questionnaire form

5. Research results and discussion:

Phases of sheep respondents' adoption to veterinary immunization in Matrouh, District, Matrouh Governorate:

This part deals with the phases of respondents' adoption to the veterinary Vaccines technology for sheep in Matrouh District, starting from the phase of awareness to such technology, then the phase of attention, the evaluation phase, the experimentation phase, the evaluation phase after experimentation and finally the phase of adoption.

Phase of heard about the idea of veterinary Vaccines of sheep

Table (3) shows that (95.8%) of the respondents in Matrouh District had heard about the technology of veterinary Vaccines for sheep, and that (17.4%) of them had heard about the technology since (10 years or more), and that (56.0%) of them had heard about the technology since (5-10 years), and that (22.3%) of them had heard about the technology (less than 5 years ago), and the source of the respondents' hearing for the first time about the idea of veterinary Vaccines of sheep as it was found that (33.7%) of the respondents had heard about the technology through the doctor. The

veterinarian, and that (37.9%) of the respondents heard about technology in an indicative meeting on technology, while parents and neighbors were a source of veterinary Vaccines technology with a percentage of (24.1%).

Table 3. Distribution of respondents after disseminating the veterinary immunization technology among them according to the phase of awareness

Awareness phase of veterinary Vaccines technology	N= 282	%
Hearing about the technology		
-Hearing	270	95.8
-Not hearing	12	4.2
Source of hearing about the technology	N= 270	
-Veterinarian	95	33.7
-Attending extensional meeting	107	37.9
-Family and neighbors	68	24.1
Date of hearing about the technology	N= 270	
-Less 5 years	63	22.3
-5-6 years	158	56
-over 10 years	45	17.4

Source: questionnaire form

2- Phase of interest to the idea of veterinary Vaccines of sheep

Table (4) shows that (95.8%) of the respondents who disseminated the technology of veterinary Vaccines of sheep in Matrouh Districts were interested in increasing their knowledge of such technology, and the most important information they wanted to know was divided into three main sections:

First: The materials available from veterinary Vaccines were represented by a frequency of (84.8%) of the respondents, which were:

- 1- Veterinary Vaccines are already available.
- 2- Veterinary Vaccines are useful in diseases spread in the desert environment.
- 3- Veterinary Vaccines for sheep do not have any side effects on animal health.
- 4- The breeder can give the Vaccines himself.
- 5- Immunizations are at Low prices.

Second: General precautions to be observed when using veterinary Vaccines for sheep, which were represented by a frequency of (58.2%) of the respondents, which are:

- 1- Veterinary medicines, vaccines and serums must be purchased from trusted places and ensure their validity.
- 2- The appropriate dose should be determined according to the condition of the animal.
- 3- A veterinarian should be consulted when the condition does not respond to treatment.
- 4- Empty medication containers should be disposed of.

Third: The distinctive characteristics of the veterinary Vaccines technology for sheep, represented by a frequency of (54.6%) of the respondents, which are:

- 1- Veterinary Vaccines activate the animal's immune system.
- 2- Serums and vaccines do not cause infection of animals.
- 3- Serums and vaccines do not have any side effects.
- 4- Veterinary immunizations are easy to use and safe when handling, transporting and storing.

It was also shown from the results of the study in the same table that the most important sources for increasing their information are (veterinary unit) by (43.6%) of the total respondents, (veterinary convoys) by (25.1%), and (parents and relatives) by (13.1%), and (A private veterinarian) with a percentage of (13.8%) of the total respondents in Matrouh Districts, among whom the technology of veterinary Vaccines for sheep were disseminated.

Table 4. Distribution of the respondents whom the dissemination of veterinary Vaccines technology for sheep among them according to the interest phase:

Phase of interest to the studied technology	N= 282	%
Interest to increase information on the technology		
-interested	270	95.8
-not interested	12	4.2
Information required on the idea on vet Vaccines for sheep	N= 270	
-available material of vet Vaccines	239	84.8
-Provisions to be considered when using vet Vaccines	164	58.2
-knowing the distinguished characteristics of the technology	154	54.6
Source of extra information to be known on the idea	N= 270	
- veterinary unit	123	43.6
-veterinary trails	71	25.1
-private vet	39	13.8
-family and neighbors	37	13.1

Source: questionnaire form

3-The phase of mental evaluation of the veterinary Vaccines technique for sheep:

In the stage of mental evaluation of the new technology, the researcher sees that individuals behave in a behavior that expresses individual differences between them, while some individuals go through a number of steps, starting from internal evaluation to positive or negative evaluation, through the steps of participatory mental evaluation, then confirmatory evaluation, sensory evaluation, then positive or negative evaluation. This happens in the same order as before and some individuals reach a positive or negative evaluation without going through the previous steps.

It is clear from the results of the study in Table No. (5) that the mental stage of evaluating the technology of veterinary Vaccines for sheep takes place in several steps as follows: (18.8%) of the respondents thought about it between his family and his neighbors, and that (13.5%) wanted to be sure of another person, while (12.4%) was studying it between himself and himself, and that (20.2%) waited to see the results with others, and that (12.0%) Disregarding this technique, and that (9.5%) was satisfied with the information he knew and tried that technique. We conclude from the previous results that the order of the mental stage of evaluating the technology after the interest in the technology is as follows:

- 1- Think about it between him and his family and neighbors (participatory mental evaluation).
- 2- He studies it between himself and himself (internal mental evaluation).
- 3- He wanted to make sure of another person (confirmatory evaluation).
- 4- wait to see the results when someone else (sensory evaluation).
- 5- He is satisfied with the information he knows and applies the technique (positive evaluation).
- 6- Disregarding the application of the technology (negative evaluation).

The reasons for abandoning the mental evaluation of the technology of veterinary Vaccines for sheep in Matrouh Districts were: lack of conviction in the technology (1.8%), lack of capabilities (1.1%), following the old methods and habits of Vaccines (1.1%), Table No. (5).

Table 5. Distribution of respondents after disseminating the idea of veterinary Vaccines for sheep among them according to the evaluation phase

Steps of evaluating the technology	N= 282	%
Mental evaluation to the technology		
- The technology mentally calculated	244	86.5
-The technology not mentally calculated	38	13.5
Steps of evaluating the idea of veterinary Vaccines of sheep	N= 244	
- an idea between me, the family and neighbors, economically Calculated	53	18.8
-Self-calculated idea	35	12.4
-Wanted to make sure from someone of my family or neighbors	38	13.5
-Waited to find out others outcomes	57	20.2
-My information was enough and tried it	27	9.5
-Disregarded the technology	34	12
Reasons for disregarding the evaluation of the technology mentally	N= 11	
-Lack of materials to provide Vaccines continuously	5	1.8
-veterinary Vaccines get cheated	3	1.1
-following the old methods and traditions for treatment	3	1.1

Source: questionnaire form

4- Phase of experimenting the idea of veterinary Vaccines of sheep

Table (6): According to the distribution of respondents who disseminated the idea of veterinary Vaccines of sheep based on the phase of experimenting to such technology that (79.2%) of the respondents, among whom the technology of veterinary Vaccines of sheep was disseminated, had experimented the technology on a small scale, and that (35.1%) of respondents experimented the veterinary Vaccines for all sheep, while (39.7%) of respondents experimented the serum for most of the animals, and (4.3%) of the respondents dismissed the technique.

It is concluded that the respondent, after the evaluation phase of the technology, began to try it as follows:

- 1- He vaccinated some sheep.
- 2- He gave the serum to all the sheep.

Results showed that the reasons for disregarding the application of the technology according to its importance were, in order, the weakness of the possibilities for applying the technology by (1.8%) of respondents, and that (1.4%) of respondents follow the old traditions for treating sheep, and the lack of good results with a percentage of (1.1%) of respondents who dismissed the application of the studied technology.

Table 6. Distribution of the respondents for whom the idea of veterinary Vaccines of sheep was spread, according to the experimentation phase

Steps for experimenting the studied technology	Number	%
-Technology tried	223	79.2
-Technology not tried	59	20.8
Steps for experimenting the idea of the technology N=299		
-Some sheep were vaccinated		
-all sheep were given the serum	99	35.1
-Disregarded experimenting the technology at the beginning and not finished to the end	112	39.7
	12	4.3
Reasons for disregarding experimenting the technology		
-insufficient materials	5	1.8
-following the old traditions for treating the animals	4	1.4
-No good results turned up	3	1.1

Source: questionnaire form

5-Phase of evaluation of the studied technology after the experiment:

Table (7): shows that the phase of experimenting the idea of veterinary Vaccines for sheep after the experimentation process takes place in several steps as follows: (75.0 %) of respondents who spread the idea of the technology had

Table 8. Distribution of respondents for whom the veterinary Vaccines technique for sheep disseminated according to the phase of their application

Steps of applying the studied technology	N=282	%
Applying the idea of veterinary Vaccines for sheep after experimentation		
-technology applied	199	70.8
-technology not applied	83	29.2
Steps of applying the idea of veterinary Vaccines for sheep N=199		
-I vaccinated my animals against bacterial diseases (infectious abortion (Brucella), tuberculosis, pseudotuberculosis, septicemia, and anaerobes) immunize my animals against viral diseases	66	23.5
-External parasites: (ticks, scabies, and lice)	62	22
-Internal parasites (cheating), liver worms, gastro-intestinal worms, tapeworms, lung worms, rift valley fever, foot-and-mouth disease, peste des petits ruminants, sheep and goat pox.	58	20.6
-Give the appropriate dose to the animal according to its condition	34	12
-When I saw the benefits of those immunizations, I told others to apply them.	19	6.7
-Not continuing to apply the technology		
Reasons for not continuing to apply the technology:		
-Lack of financial resources.	9	3.2
-Resorting to traditional methods of treatment.	7	2.5
-No good results turned up	3	1.1

Source: questionnaire form

evaluated it after the experimentation on a small scale, then decide whether to continue implementing the technology or not, (18.8%) of respondents studied the results of his experience between him and his family and neighbors, and that (22.0%) of respondents studied the results of his experiment, get convinced and implemented it, and (4.3%) of respondents dismissed the technique

Table 7. Distribution of respondents for whom the veterinary Vaccines technique for sheep disseminated according to their evaluation phase after the experiment

Steps for evaluating the technology after experimenting	N= 282	%
-Technology evaluated	211	75
-Technology not evaluate	71	25
Steps for evaluating the technology after experimenting N= 211		
-results were calculated between respondent, family and neighbors	53	18.8
-Results were self- calculated	62	22
-Convinced by the technology and was implemented	84	29.8
-disregarded the technology	12	4.3

Source: questionnaire form

6- Phase of adopting the idea of veterinary Vaccines of sheep:

Table (8): shows that the respondents who disseminated the idea of veterinary Vaccines of sheep were distributed among them according to the phase of adopting the technology were as follows: (70.8 %) of respondents who spread the idea of veterinary Vaccines for sheep had adopted the technology after adopting it after experimentation, (23.5%) of the respondents had vaccinated against viral diseases of animals, and that (22.0%) of the respondents had immunized against bacterial diseases, and that (20.6%) of the respondents had given the appropriate dose to the animal according to its condition, that (12.0%) of the respondents, upon seeing the benefits of veterinary immunizations, encouraged others to implement them, (6.7%) of the respondents dismissed this technique. The reasons for not continuing to implement the idea were: poor financial capabilities by 3.2%, resorting to traditional methods of treatment by 2.5%, lack of good results by 2.5% of the respondents.

Comment:

The results showed that the adoption behavior of the respondents among whom the veterinary immunization technology was spread, consists of a set of events that occur over time, starting from awareness and attention to the technology up to the phase of adoption.

The summary of these results is illustrated in Table (9), as (95.8%) of the respondents among whom the veterinary immunization technology was spread, fell in the awareness and attention phase, (95.8%) in the attention phase, (86.5%) in the evaluation phase, (79.2%) in the experimental stage, (75.0%) in the evaluation stage after experimentation, (70.8%) of the respondents who adopted this technology, and (63.8%) of the respondents, among whom the technology under study was disseminated continued to apply the technology.

Table 9. Distribution of the respondents among whom spread the veterinary Vaccines technique for sheep according to the phases of the adoption process

Steps of adoption process of the technology of veterinary Vaccines for sheep	Number	%
Awareness & attention	270	95.8
Interest	270	95.8
Mental evaluation	244	86.5
Experimentation	223	79.2
Evaluation after experimentation	211	75.0
Adoption	199	70.8
Continuity to apply the technology	189	63.8

Source: questionnaire form

5.2.: The relationship between the degree of sheep Raisers' adoption to the veterinary Vaccines I Matrouh Districts, Matrouh Government and some studied personal characteristics

To test the relationship between the degree of respondents' adoption at Matrouh District for the technology of veterinary immunizations for sheep and some of their studied personal, characteristics i.e. (Age, Educational level, Size of the agricultural animal possession, Size of the sheep-animal agricultural possession, Formal social participation, Urban frequent visitations, Participation in extensional training programs, Motives for participating in developmental extension activities, Frequent visitations of Districts that provide agricultural services, Farm animal modernization), the simple correlation coefficient (Pearson) was used to identify the significance of that relationship.

Table (10): shows a direct significant relationship between the degree of respondents' adoption of the Matrouh District for veterinary immunization technology for sheep, the following characteristics of the respondents at the level of significance 0.01: (Size of the agricultural animal possession, Size of the sheep-animal agricultural possession, Formal social participation, Urban frequent visitations, Participation in extensional training programs, Motives for participating in developmental extension activities, and Frequent visitations of Districts that provide agricultural services).

While the results showed that there was no significant relationship between the degree of respondents' adoption of the Matrouh District for veterinary Vaccines technology for sheep and the following characteristics of the respondents: Age, Educational level, , and Farm animal modernization.

Based on these results and with reference to the first statistical hypothesis, "there was no statistically significant relationship between the degree respondents' adoption of the Matrouh District for the technology of veterinary immunizations for sheep and their personal characteristics studied, which are: (Age, Educational level, Size of the agricultural animal possession, Size of the sheep-animal agricultural possession, Formal social participation, Urban frequent visitations, Participation in extensional training programs, Motives for participating in developmental extension activities, Frequent

visitations of Districts that provide agricultural services, Farm animal modernization), thus the alternative hypothesis can be accepted, Whereas this statistical hypothesis can't be rejected in terms of the following studied personal characteristics of respondents: (Size of the agricultural animal possession, Size of the sheep-animal agricultural possession, Formal social participation, Urban frequent visitations, Participation in extensional training programs, Motives for participating in developmental extension activities, and Frequent visitations of Districts that provide agricultural services).

Table 10. The values of the simple correlation coefficient between the degree of adoption of the studied sheep Raisers to the technology of immunizations

Respondents' studied independent variables	Values of correlation coefficient Veterinary Vaccines
1- Age	0.096
2- Education level	0.049
3-Size of the agricultural animal possession	**0.433
4- Size of the sheep-animal agricultural possession	**0.384
5- Formal social participation	**0.240
6- Urban frequent visitations	**0.172
7-Participation in agricultural extension programs	**0.167
8-Motives for participating in developmental extension activities	**0.317
9-Frequent visitations of Districts that provide agricultural services	**0.126
10-Farm animal modernization	0.038

(**) the relationship is positive at level of 0.01

5.3.: Determining the degree of contribution of the studied personal characteristics of the respondents to the overall variance that explains the degree of adoption of the respondents' sheep Raisers to the technology of veterinary Vaccines for sheep in Matrouh Districts, Matrouh Governorate.

To test the statistical hypothesis related to the impact of independent variables combined on the total variation that explains the degree of respondents' adoption of the veterinary Vaccines technique for sheep in Matrouh Districts, Matrouh Governorate as a dependent variable, in Table (11) and using the step-wise multiple regression method shows the contribution of each of the independent variables combined a value of F (19.104) at significant value at the level of 0.01, and the value of the adjusted coefficient of determination at the fifth step was 24.4%, which determines the contribution of the model variables in explaining the total variation in the dependent variable, 18.4% of it is attributed to Size of the sheep-animal agricultural possession, 1.7% to Urban frequent visitations, 1.0% to official Formal social participation, 1.9% to the degree of Frequent visitations of Districts that provide agricultural services, and 1.4% is attributed to variable Motives for participating in developmental extension activities.

According to the previous results, some parts of the second statistical hypothesis were rejected, whereas the alternative theoretical hypothesis was accepted the following independent variables i.e. "Size of the agricultural animal possession, Formal social participation, Urban frequent visitations, Motives for participating in developmental extension activities, and Frequent visitations of Districts that provide agricultural services" had contribution in explaining the total variation for the degree of sheep Raisers' adoption to the technology of veterinary immunization in Matrouh Districts, Matrouh Government as a dependent variable.

Table 11. Percentage of the contribution of the relevant independent variables to the explained total variance of the degree of respondents' adoption of the degree to which respondents' adoption of veterinary Vaccines technology for sheep in Matrouh Districts, Matrouh Governorate

Analysis steps	Independent Variable	Multiple Correlation efficient (R)	Collective coefficient	Partial Coefficient	Regression coefficient B	Calculated F	significance
First	Size of the agricultural animal possession	0.187	0.184	0.184	0.044	64.565	0.01
Second	Urban frequent visitations	0.206	0.201	0.017	0.057	36.246	0.01
Third	Formal social participation	0.220	0.211	0.010	0.479	26.080	0.01
Fourth	Frequent visitations of Districts that provide agricultural services	0.241	0.230	0.0190	0.167	21.998	0.01
fifth	Motives for participating in developmental extension activities	0.257	0.014	0.014	0.133	19.104	0.01

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تبنى مربي الأغنام للتحصينات البيطرية بمركز مطروح بمحافظة مطروح

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المخلص

استهدف البحث دراسة تبنى مربي الأغنام للتحصينات البيطرية بمركز مطروح بمحافظة مطروح، وتم سحب عينة عشوائية بسيطة بلغ عددها 282 مبحوثاً تمثل 26% من المربين، تم توزيعهم بواقع (96) مربي بقرية الجروالة، و(78) مربي بقرية سيدي حنيش، و(77) مربي بقرية الزيات، و(31) مربي بقرية الحلازين. استخدمت عدة أدوات ومقاييس إحصائية، كالتكرارات، والنسب المئوية وذلك لوصف الخصائص الشخصية للمبحوثين بمنطقة الدراسة. كما تم استخدام اختبار بيرسون للتعرف على العلاقة بين الخصائص الشخصية للمبحوثين وبين درجة تبنيتهم للتحصينات البيطرية، كما تم استخدام نموذج التحليل الارتباطي والانحداري المتعدد المتدرج المساعد لتحديد نسب مساهمة كل من المتغيرات المستقلة ذات العلاقة الارتباطية المعنوية في تفسير التباين الكلي للتغير في درجة تبنيتهم للتحصينات البيطرية، وذلك بالاستعانة بالحاسب الآلي باستخدام حزمة البرامج الإحصائية للعلوم الاجتماعية SPSS. وأوضحت النتائج أن (95.8%) من المبحوثين الذين تم نشر تقنية التحصين البيطري للأغنام بينهم يقعون في مرحلة الوعي والانتباه، ثم (95.8%) منهم في مرحلة الإهتمام، ثم (86.5%) في مرحلة التقييم، ثم (79.2%) في مرحلة التجريب، ثم (75.0%) في مرحلة التقييم بعد التجريب، وأن (70.8%) من المبحوثين تبناوا هذه التقنية، وأخيراً (63.8%) من المبحوثين الذين تم نشر التقنية موضع الدراسة بينهم أستخدموا في تطبيق التقنية. وأوضحت النتائج وجود علاقة معنوية طردية بين درجة تبني المبحوثين بمركز مطروح لتقنية التحصينات البيطرية للأغنام والخصائص التالية للمبحوثين عند مستوى معنوية 0.01 وهي: (حجم الحيازة الزراعية الحيوانية، وحجم الحيازة الزراعية الغنمية، والمشاركة الاجتماعية الرسمية، التردد الحضري، والمشاركة في البرامج الإرشادية، ودوافع المشاركة في البرامج الإرشادية، والتردد على المراكز الإرشادية).