



**HEBRON UNIVERSITY**

**College of Graduate Studies**

**A Comparative Analysis of the Three Production Systems of  
Sheep and Goats in the West Bank  
(Northern and North – East Hebron District)**

**By**

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This Thesis is submitted in partial fulfillment of requirements for the degree of Master of Science in Sustainable Natural Resource and their Management, College of Graduate Studies, Hebron University, Palestine.

**March 2011**

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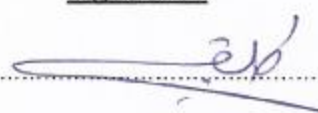

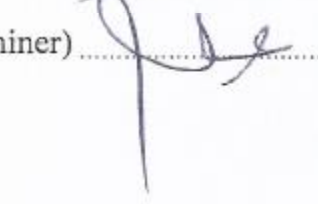
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## **Dedication**

To my mother deceased Zenab Amro, and to my father Hussein Amro, I wish that God would give them a happy life forever, and extends the old. And I dedicate also this thesis to my country Palestine and to my husband, my brother, my sisters and any person help me to end this thesis.

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## STATEMENT OF AUTHOR

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Date of Submission: 6/ 12/ 2010

## **Biography of the Author**

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## List of Abbreviations

ADOH	Agriculture Department on Hebron
ARIJ	Applied Research Institute Jerusalem
A.R.O	Agricultural Research Organization
BN	Bani-Na'im
BT	Beit-Omar
CP	Crude Protein
DM	Dry Matter
DRC	Domestic Resource Cost
FAO	Food and agriculture organization
GDP	Gross Domestic Production
EARO	Ethiopian Agricultural Research Organization
EE	Ether Extract
GIS	Geographical Information System
GS	Gaza Strip
HL	Halhoul
ILCA	International Livestock Centre for Africa
JD	Jordan Dinar
LRC	Land Research Center
MoA	Ministry of Agricultures
MoPIC	Ministry of Planning and International Cooperation
MP	Meteorological Palestinian
PA	Palestine Authority
PCBS	Palestine Center Bureau of Statistics
PMOA	Palestine Ministry of Agriculture
PT	Palestine Territories
SPSS	Statistical Package for Social Science
SR	Sa'ir
PS	Production system
USA	United State of America
UAWC	Union of Agriculture Work Committees
WB	West Bank

*HEBRON UNIVERSITY*

Abstract

**Comparative analysis for the three production systems in  
sheep and goats in West Bank  
(Northern and North – East Hebron District)**

This study has seeks to describe, analyse, and estimated the comparative analysis for three production systems of sheep and goats in northern and north-eastern of Hebron district. The main objectives of the research was to the compare between three production systems for sheep and goats through the identification of the most important social-economic characteristics to family members, and identify the most important inputs and output of production systems and then economically analyzed.

The empirical part of the work is based on several informal and formal survey and participant observation of 150 owners of sheep and goats; the survey period covers the financial year 2008.

The results show that female contributes 45% to the daily work of sheep and goats farms. It also shows that a raising and production practice of sheep and goats is limited to age which range between 30-69 years. Due to building expansion and overgrazing and climate weather ; the extensive production system decreased , in spite of the profit of animals head is high and estimated (55.8 JD) compared with the other production systems.

## **1. Introduction**

Palestine is located at the meeting point between Eurasia and Africa. It is located at the eastern-southern corner of the Mediterranean Sea. This location creates unique geography and ecosystems which encountered endemic plants that do not exist in other places in the world and makes the introduced plants coexist strongly. Plants and animals of three continents have interacted and spread throughout history. Consequently, this contribution to the rich diversity of Palestine flora and fauna has long captured the interest of ecologist and scientist alike (Qumsiyeh, 2007).

The climate of Palestine exhibits large changes within small distances. There are four topographical Zones in Palestine that has different distinctive climates: coastal, semi-costal, mountain and semi-arid zones (Tamimi, 2002). This endows the Palestinian territories a unique location for agriculture. Both plant and animal production are important in the agriculture sector in Palestinian territories, where agricultural production was valued at 1,366.6 million US \$ in 2007/2008, of which 60.9% was attributed for plant production, and 39.1% for animal production (PCBS, 2008).

### **1.1. Problem Statement**

The Palestinian agriculture sector is constrained by a large dependence on dry land (marginal area and steppe rangeland). A large percentage of small ruminants (sheep and goats) are found in Palestine especially in Hebron. Where 2008 statistics show the total number sheep in PT reached 688,899 distributed as follows: 639,159 in the West Bank and 49,740 in the Gaza strip, 27.6% of sheep is in Hebron. The total number of goats in PT is 322,082, there are 3.5% in the Gaza strip and 96.5% in the West Bank and mainly the highest numbers are present in Hebron, Jenin, and Bethlehem respectively (Table 1). However the largest number of Sheep and goats are located in Hebron districts. In Hebron the Farmers are reared different sheep breeds like Awassi,

Assaf, and different goat breeds like shami\_goats, local goats (PCBS, 2008). The sheep and goats are reared on dry lands and field crops (forage cereals, bitter vetch and vetch), consequently the low return on inputs of sheep and goats (PCBS, 2008).

Table 1: Number of Sheep and Goats, in the PT by Governorate, 2007/2008

<b>Region</b>	<b>Number of sheep</b>	<b>Number of goats</b>
<b>PT</b>	688,899	322,082
<b>GS</b>	49,740	11,280
<b>West-Bank</b>	639,159	310,802
<b>Hebron</b>	190,316	95,460
<b>Jenin</b>	126,316	54,078
<b>Nablus</b>	71,401	22,709
<b>Bethlehem</b>	50,538	37,864
<b>Tubas</b>	41,182	8,736
<b>Tulkarm</b>	24,450	6,726
<b>Qalqiliya</b>	24,659	7,062
<b>Salfit</b>	7,288	7,259
<b>Ramallah and al-bireh</b>	39,632	28,653
<b>Jericho</b>	26,117	24,648
<b>Jerusalem</b>	37,260	17,607

(PCBS, 2008)

The value-added of livestock is much lower than in plant production. In 2004/2005 season, the value-added of livestock for the PT, WB, GS, and Hebron was 10.2%, 7.7%, 20.0%, and 7.05% respectively. In Hebron district the value -added is rely on sheep and goats husbandry (PCBS, 2006).

Feed is a major cost of sheep and goats production, and improved conversion of feed into product is one approach to increasing the profitability of an enterprise. The cost of sheep and goats feeding is the highest component of the inputs. In 2004/2005 season, it was US \$ 308,872,000, representing 78.6 % of the total inputs cost of production (PCBS, 2006). Local animal feed production including -rangeland crops, green roughages, dry roughages and concentrates- does not exceed 19.4% of the total feed required. This means



that the gap in animal feed coverage, which needs to be imported, is more than 80% (Abu Laban and Injoum, 2006).

Agriculture sector play a major role in the socio-economic life of the Palestinian farmers, also there is a transmitting into modern farming by introducing technology in this sector, which will increase its contribution in the Gross Domestic Product (GDP) (PCBS 2005), it is accounting for about 30 percent of both Gross Domestic Product (GDP) and employment, with about 50 percent of Palestinian people benefitting directly from agricultural returns (World Bank). Furthermore, we have to take into consideration the continuous aggressive measures of Israeli occupation into this sector to destroy it, which putting Palestine under our responsibility to develop this vital strategic sector (PCBS 2005).

Sheep and goats rearing are the main source for the owner in the Hebron district, which the livelihoods depends on it (ARIJ, 1994). The sheep and goats owners considered the poorest groups in west bank; such as village, cluster and hamlet, without basic services such as health, education, transportation, electricity networks and water networks (Janazereh, 2007). Since the Palestinians are red meat consumers and most of their red meat comes from small ruminants (livestock), sheep and goats sector is one of the vital sectors. But unfortunately the statistics shows that the self-sufficiency level of red meat and milk are 35% and 61% respectively and the rest has to be imported from Israel or via Israel (FAO, 2009). The most problem that meet the animal production sector is the numbers of sheep and goats at this time are decreases, in spite of the need to increase in this sector, because the numbers of population are increase, provide employment opportunities for the work of livestock farms (PCBS, 2008).

## **1.2. Purpose of the Study**

The purpose of this study is to study the impacts of the socioeconomic situation on three production systems and the factors that affect the cost of the production, where no previous studies to compare between the production systems in Hebron are found.

The research carries out the following questions:

1. Is the enterprise of sheep and goats are high profitability?
2. What is the socioeconomically reflect to productivity of sheep and goats?
3. What are the reasons that cause decrease number of small ruminant (sheep and goats) in study area?
4. What are the types of production systems that exist in the north and north-eastern Hebron district?
5. What is the best type of production system that is suitable for each area in study?

## **1.3. Objectives of study**

The main objective is to compare between three production system for sheep and goats in north and north-eastern of Hebron district in Palestine. Other secondary objectives are:-

1. Describe the socio-economy of sheep and goats systems in north and north-east of Hebron districts.
2. Analysis the advantages and disadvantages of each production system in these areas.
3. Distinguish between each of production system in cost, input, and output.
4. Study the profitability of different production systems.
5. Review the comparative analysis of the different production systems.

#### **1.4. Hypothesis of the study**

- ✓ The socio-economical factor in production system will affect the productivity in the different production systems.
- ✓ Increase the cost of feeding animals will increase the price of products of sheep and goats.
- ✓ The type of production systems will affect the cost of input and output of sheep and goats.

#### **1.5. The study structure**

The study consists of six chapters. The first chapter focuses on the importance of Palestine location and the number and importance of sheep and goats in the Hebron district, the research problem, and objectives.

The second chapter focuses on the literature review of studies deals with the description of similar studies. In chapter three, we will discuss the methodology of the study, characteristics of study area, distribution of sheep and goat, sources of information, sample and data collection and the last determinants of the research.

In chapter four, we will deals with the analysis of the results of study socio-economic of sheep and goats production systems, distribution of family member's management of Sheep economical factor affected production system, input and output of (sheep and goats).

Chapter five deals with the discussion of the results of the study which appears in chapter four. And the last chapter, summarizes conclusions and recommendations of the study.

## **2. Literature Review**

### **2.1. Classification of production systems in sheep and goats**

Sheep and goats are widely distributed and adapted to a wide range of environmental diversity (EARO, 2000; Ibrahim, 1998). They are of great importance as major sources of livelihood (Tembely, 1998) and contribute to the subsistence of landless, small-holder and marginal farmers (Adugna, 1998) especially to the poor in the rural areas throughout the developing countries (Devendra and Burns, 1983). Small ruminant's production systems and the relative importance and potential for increased production by species in varied areas differ markedly due to differences in resource endowment, climate, population, and disease incidence, level of economic development, research support and government economic policies (Beets et al., 1990). The majority of sheep and goats are reared in the arid and semi-arid regions where extensive animal production system prevails and permanent meadows and pastures (rangeland) provide the majority of animal feed. The herd composition in these predominantly pastoral systems includes varied proportions of small ruminants depending on several environmental, social and economic factors (FAO, 1970).

Devendra in study (1980) shows that the nutrition of goats and sheep is the most important factor affecting the performance of these species. This is because feeding is the principle limiting factor in most parts of the tropics whereby small ruminants are seldom allowed to express their genetic potential. Sheep and goats contribute to a broad range of production systems. The most common system throughout the developing countries involve either the extensive system with large herds and/or flocks grazing on arid and semi-arid rangelands or the intensive system with smaller herds and/or flocks kept in confinement, mostly in the humid tropics. Both systems are characterized by low input use (Safilios-R, 1983). Sheep and goats are important in development because of their ability to convert forages and crops and

household residues into meat, fiber, skins and milk. The economic importance of each of the products varies between regions, especially in the developing countries. In terms of total output, sheep and goat products are the most important in developing countries where 45% of all sheep meat, 54% of all sheep milk, 93% of all goat meat, and 73% of all goat milk are produced (FAO, 1981).

In some countries such as Malaysia the small ruminants (sheep and goats) are raised under several production systems depending on the herd size and feed availability, with little organized commercialization efforts. The production systems included extensive, intensive, and semi-intensive and the animal-tree crop integrated systems (Rajion et al., 1993).

### **2.1.1. Traditional or extensive production system**

**Traditional or extensive system:** sheep and goats are raised in fence or outdoors, and feeding is based mainly on existing natural resource obtained directly by grazing, the supplements (grain and forage) produced by the farmers themselves and those supplements that they buy to cover feed deficits. The flock is usually shut into a yard at night (FAO, 1988). Others use simple extensive systems where the animals live of pasture as the only feed source, i.e. no feeding with supplements, such as concentrates. (Bravo, 2005).

Extensive management systems for sheep production are the most common in all sheep producing countries, and extend from lowland farming systems where relatively small flocks graze fenced enclosures to rangeland management systems where large flocks live on unfenced pastures. Flock size, the ratio of sheep to shepherds and specific management practices follow local norms (Kilgour., et al .2008).

### **2.1.1.1. Advantages of extensive (traditional) system**

1. The main advantage of this system is that it convert otherwise unusable fibrous plant material into products useful to man and thereby enable him to live in relatively inhospitable parts of the world (Sherman *et al.*2008).
2. Extensive grazing refers to the use of large areas of unimproved natural land - rangeland - for free roaming grazing livestock, (Gudmundsson and Thorhallsdottir .1999)
3. Cost and labor can be kept at a minimum. (Gudmundsson and Thorhallsdottir .1999)
4. Controlling shrub growth and dispersing seeds through their hoofs and manure, which can improve plant species composition. In addition, trampling can stimulate grass tillering, improve seed germination and break-up hard soil crusts (Haan. et al.1996).

### **2.1.1.2. Disadvantages of extensive (traditional )system**

- 1.Limited control and flexibility in management and high environmental, economic and social variability,(Gudmundsson and Thorhallsdottir .1999)
- 2.Low-input – goats are grazing freely with, or without, supervision on natural vegetation, typically in areas with relatively low rainfall with no external inputs. Such as productivity is low and is under nutritional stress for much of the year due to cropping intensity. Sheep carry heavy internal and external parasite burdens (EARO, 2000).
- 3.Overgrazing causes; eventually kills the plants, reduces the longevity of the stand and exposes more soil to erosion. Increases the chance of sheep ingesting infective internal parasite larvae. Creates bare spots, creating opportunities for undesirable weeds, ( Hale ., et al.2010).
- 4.The biomass annually produced by the rangelands depends mainly on the absolute availability of the growth limiting factors and is therefore strongly

influenced by both the quantity of precipitation and the quality of the soils, (Affected with rainfall) (FAO, 1986).

### **2.1.2. Semi-intensive system**

**Semi-intensive:** Animals are let out for grazing for a restricted period, usually in the afternoon, and confined to the shed at night,(Carman, 1989). This type found in Palestine. Other says that a few animals are gazing during the day and put into a protective shelter at night, and then feed to concentrate (FAO, 1988). Semi-intensive systems are characterized by feeding the animals with pasture and concentrates as a supplement. This system can either be used in limited periods only (for increased growth)(Ulvshammar, 2008).

#### **2.1.2.1. Advantage of semi-intensive system**

1. Relatively high –input,(Sherman *et al.*2008). In other hand, the performance of animals is improved and higher inputs used with the objective of obtaining a high output of product (Orskov, 1982).
2. Less affected by climate; due to use feed supplement (Binh., et al. 2004).
3. It may make the best use of limited land resources.
4. And offers the greatest protection for the flock from both predators and parasites (Bengtsson and Whitaker, 1988).

#### **2.1.2.2. Disadvantage of semi-intensive system**

1. Increase labor and the capital investment required for facilities (Bengtsson and Whitaker, 1988).
2. Generally poor access to veterinary service, high cost of drugs and vaccines, lack of skills, knowledge or interest in disease surveillance and reporting, and the absence of trained auxiliaries limit production, (IFAD - RADISCON, 1998).

3. The animals are fed with manufactured concentrates and forage and the system requires housing of the animals, health programs and hand feeding etc. making production costs high, (Ulvshammar, 2008).

### **2.1.3. Intensive system**

**Intensive:** In which the animals are confined to yards and shelters and feed is brought to the flock. it may make the best use of limited land resources (Bengtsson and Whitaker .1988). Usually are raised indoors of small to medium size flocks as farm, The intensive sheep management and the wide spread application of the controlled breeding techniques, such as artificial insemination and out-of season breeding, increase the need for an accurate and practical test for early pregnancy diagnosis. (Goel and Agrawal, 1992; Gordon 1999).

#### **2.1.3.1. Advantage of intensive system**

1. It is not affected by the climatic conditions.
2. Use most of the feed for production is zero grazing (Devendra, 1985).
3. It has high production levels. ( Gizaw ,et al. 2010).
4. Animals reared under this system are frequently sold as breeders or for fattening purposes, as their performance and health can be conveniently monitored. Frequently, animals reared under this system had an average daily gain in the order of few folds over those kept under extensive system (Rajion et al., 1993).
5. It is a system which favors those situations where land is limiting and the existence of abundant supplies of crop residues and agro industrial by-products (Devendra, 1985).
6. This system offers the greatest protection for the flock from both predators and parasites (Bengtsson and Whitaker, 1988).
- 7.



### **2.1.3.2. Disadvantages of intensive system**

1. The animals are fed with manufactured concentrates and forage.
2. The system requires housing of the animals.
3. Health programs and hand feeding etc.
4. Other characteristics are the use of artificial insemination. For this result making production costs high (Sherman *et al.*2008).
5. The intensive system required substantial inputs both in investments and management (Rajion et al., 1993)

### **2.2. Distribution of sheep and goats in the study area**

The climatic conditions which are existed in the WB, in general and particularly in the city of Hebron, are suitable for breeding and caring sheep and goats. Therefore, the breeding of sheep and goats are also very important in this region, where it is ranked first in terms of the number of sheep and goats breed in Palestine. The number of sheep and goats in 2007 is 225,464, 92,944 .respectively (PCBS, 2007).

There is a dramatic increase in the number of sheep and goats in the last seven years at Hebron area (Table 2 and Table 3), and different fluctuations at the study area and this due to the unstable political situations and the circumstances which affect on the access of Palestinian workers to the Israeli labor market. When Palestinians are allowed to work in Israel they do not give high attention to agriculture and animal Husbandry. But when Israelis imposed closures and prevented workers from working in Israel, the first alternative source of income -they think about- is to establish animals' farm or to cultivate land.

Table 2: Number of sheep in Hebron district and the study area 2002-2008

Years	Hebron	Bani-Na'im	Sa'ir	Halhoul	Beit-Ummar
01-02	172,362	12965	7363	6174	3187
02-03	192,650	13218	9801	10107	8478
03-04	178,220	12550	9730	9930	8390
04-05	187,500	14000	6000	6750	7000
05-06	191,100	14000	5000	6000	6300
06-07	200,250	14000	6000	6750	6000
07-08	167,189	15000	5000	6100	6000

Sources: PCBS, 2007, MOA, 2008.

Table 3: Number of goats in Hebron district and the study area 2001-2008

Years	Hebron	Bani-Na'im	Sa'ir	Halhoul	Beit-Ummar
01-02	77,223	7485	5761	4734	2668
02-03	80,000	7485	5761	4734	2618
03-04	70,000	6700	3200	3000	2300
04-05	73,000	7000	2000	2000	2300
05-06	69,500	7000	3200	2000	2200
06-07	82,500	7000	3000	2000	2300
07-08	85,023	5000	1700	1000	1500

Sources: PCBS, 2007. PMOA, 2008.

### 2.3. Socio-economic factor

Agricultural extension interventions should not be seen only in the context of increasing agricultural output, but, it is part of the effort to achieve a balanced social and economic development of the rural areas (Adams, 1982). However the socio-economic factors have an effect on animal and farm management, decision-making and the general perception of breed and species of the farmers. These factors will therefore affect the design and implementation of a breeding program. Without a good understanding of these factors, it would be very difficult to persuade the local farmers to fully participate and cooperate in a breeding program (Kosgey 2004). The factors, e.g., land ownership, farm size and animal ownership do not seem to be related to animal breeding directly, but are an important source of information on general household characteristics.

### **2.3.1. Family size**

The size of the family is an important socio-economic factor as well as an indicator of overall development. (Dev., et al.2003). In Palestine, PCBS survey in 2006 shows that the average size of the holder's household is about 8 people, but Al-Jabari study (2010) shows that the size family in Hebron is about 12.4 people.

### **2.3.2. Family members' classification**

The Palestinian Central Bureau of Statistics in (2005) shows that the agricultural owners distributed in the Palestinian Territory by region is 89.0% in the West Bank and 11.0% in the Gaza Strip. It shows that the average age of agriculture owners is 50.7 years; on the other hand it shows that 95.5% of the agriculture owners are males and 25.5% of the owners have a household size greater than 9 people. Regarding the educational attainment, the results of PCBS in 2006 shows that 24.6% of the agricultural holders who work on their holdings in the PT have a preparatory school certificate, and 8.5% have a bachelor's degree.

### **2.3.3. Managements of sheep and goats**

The percentages of males in agricultural work are higher than females. Males are responsible for giving the animal's water to drink, food preparation, treatment of animal, and grazing of animals. In Palestine, men are responsible for managing sheep and goats such as carrying out buying, selling, activating, transportation and external household, but boys sometime herd the flock while girls are assigned to household work and assist in all kinds of farm work. On the other hand, females do almost all household work and agriculture hand work such as milking, feeding, milking processing and watering, and these represent more than 90% in dry land of Palestine (ARIJ 1994 and Dudeen 2009).

#### **2.3.4. Economical factor**

The efficiency of the allocation of the sheep and goats farming systems is evaluated through an economic analysis in which different levels of the family-farm household system are studied in Palestine by Abdul-Hamid Musa (2010). There are many economical factors which affect on the profits of sheep and goats project, such as farms income, feeding, type of construction, tools, land tenure and so on.

##### **2.3.4.1. Types of housing or bran in sheep and goats**

Yalçın (1986) mentioned that main objective of housing means protecting the adult animals and the new-born against cold weather and predators, listing and types of housing are as follows:

1. Sedentary and transhumant sheep and goat flocks are usually housed in the winter. The sheds are simple and often unhygienic, and made of stone, bricks, mud bricks or wood depending on the availability of these materials. Courtyards and open shelters near or adjoining the houses are also used for this purpose. As intensive and semi- intensive systems.
2. In mild regions they are kept in simple enclosures or in a nearby cave, if available, when necessary.
3. Nomadic flocks spend the winter on the lowland ranges without the provision of any kind of shelter. In the open conditions, flocks are always shepherded and special shepherd dogs are used for protecting the flocks against predator animals. As extensive system.

Janazerh(2007) said that most of barns if not all are constructed randomly without any consideration to the proper design such as direction, height, ventilation, size, area per head, kind of floor and separators. They look simple and in miserable conditions. More than that about 9% of herders put their herds in opened barns without any shelter. While 19% put their herds in caves, another 30% put their herds in tents. Only 42% have shaded barns or stores

under their residence. Weather, simple sheds (shelters) may be all that is needed.

#### **2.3.4.2. Sheep and goats feed source and diet**

Animal husbandry can use three types of feeding resources (Boutonnet, 1997): natural pasture, by-products and crops.

⇒ Natural pastures are not created by human labor and the feed provided has no production cost. The amount of animals maintained on it depends on its availability and accessibility (social and demographic conditions).

⇒ By-products may be domestic or industrial. The ideal nutrition program supports optimum production, is efficient and economical, and minimizes related problems. In order to understand the fundamentals of small ruminant nutrition, we must first know the nutrients essential for growth, production, and reproduction. These essential nutrients are: Energy (fat and carbohydrates). Protein, vitamins, minerals and water.

⇒ Third resource is crops (grain, cultivated grass, fodder crops). Their cost, from the point of view of animal husbandry, is equivalent to the market price of those products, or to the price of alternative products cultivated on the same land. Fodder crops can be used only if the price of the animal product(s) is high enough to pay for the fodder crops used, at the market price (Boutonnet, 1997)

In Palestine the main feed source are rangeland as in extensive or semi intensive feeding system and some time use supplement concentrate but in intensive feeding system the source of feed is concentrate or roughage.

Schoenian (2008) says that Sheep or goat's nutritional requirements depend on its size (weight), age, and stage of production. Goh and Rajion (2007) say that feed cost is not only an important concern in the management of national economies, but also is a major cost burden of livestock farms, and thus a major strategy to develop the livestock industry in developing countries could

be to increase the use of indigenous feed resources to reduce the cost of importation.

#### **2.3.4.2.1. Prices and costs of feed**

Feed is the high percentage of sheep and goat's production ranges from 60-70% (Bsharat2005). Producers can control feed costs by maximizing the use of pasture and browse, producing their own harvested feeds, mixing their own rations, shopping around for feed ingredients, buying and storing feed in bulk, minimizing feed wastage and weighing all feed inputs (Schoenian, 2002). In Africa, purchasing grain to feed goats is expensive and competes with man. This may not in the long-run but be sustainable as the demand for grain rises with the growing population. Basing supplementary feeds on oil cakes and other by-products of food processing are more sustainable option (David., et al .2008). Specifically, there is an increase in the nutrition factor which relates to the rational use and quality improvement of used animal feed, as animal feed constitutes. In Palestine, Janazerh study (2007) shows that the average of quantity concentrate which provided to animals per day is around 740 g/head/day and the average of annual cost of this quantity is based on the prices of the first half of 2007 is around 300 NIS. Feed cost is not only an important concern in the management of national economies but also is a major cost burden of livestock farms, and thus a major strategy to develop the livestock industry in developing countries could be to increase the use of indigenous feed resources to reduce the cost of importation ( Goh and Rajion ,2007).

In Palestine the cultivated land area of animal feed in 2003/2004 is 156,507 dunums represents 8.6% of the total cultivated land (Table 4). The produced quantity is 33,888 tons with estimated value of US \$8.245 million (PCBS, 2005).

The value of Palestinian imports of animal feed in 2004 was US \$133.442 million distributed as follows: milled animal feed and additives US \$ 93.96

million, un-milled barley was \$ 27.658 million and un-milled maize was \$11.824 (PCBS, 2007). Mostly, the Palestinian import of animal feed is from Israel. The percentage of milled animal feed imported from Israel in 2004 was 99.8%.

Table 4: Local Production of Animal feed in PT (2003/2004)

<b>Crop</b>	<b>Area (dunum)</b>	<b>Quantity (ton)</b>	<b>Value (US \$ 1000)</b>	<b>Price \$/ton</b>
Barley	101,836	14,672	3,392	231
Clover	27,190	15678	3,536	226
Vetch	23526	1908	852	447
Broom Corn	2146	343	72	210
Other clover	407	43	39	907
Sorghum	1302	1144	300	262
Other forage crops	100	100	54	540
<b>Total</b>	<b>156,507</b>	<b>33,888</b>	<b>8,245</b>	<b>2,823</b>

Source: PCBS, 2005. Agricultural Statistics 2003/2004

#### **2.3.4.2.2. The forage feed in sheep and goats (Roughage)**

Blanchet et al, (2003) says that forage grass and legume species have their own unique growth, persistence, and quality characteristics. They respond differently to soil conditions, weather patterns, fertility, and grazing management. Plants that are currently growing in your pastures may be different from one area to another. Forage may be pasture, straw, vetch, hay, lucerne, and crop residue.

Dudeen (2009) shows that cultivation of forage and crop like vetch or Lucerne was not used, and the main reason for not cultivating fodder crop is low rainfall in the area of sheep and goats farming systems in West Bank.

#### **2.3.4.2.3. Rangeland and type of grazing use in extensive and semi-intensive production systems**

Rangelands are defined by Harlan as “geographical regions dominated by grasses, grass-like plants, forbs and with or without scattered woody plants. These rangelands occupies large areas of dry lands and harbor wide array of plant species that are the basis for grazing animals and provide other medicinal and industrial benefits” (Abu Zant, et al,2005). The Palestinian agriculture law article 2 for the year 2003, defines rangeland as: all public lands and filed with vegetative cover use for animal grazing including natural and cultivated. The same law defines rangeland plant as all plant grown in rangeland includes herbs, grasses, shrubs regardless whether it edible by animals or not (Bregheith, 2006). These rangelands provide the major source of feed for Bedouin livestock production systems, a valuable resource for sustaining rural communities (Shomo, 1995). The total rangeland area in West Bank is about 218,000 hector, and mainly located in the eastern slopes. Because of the Israeli occupation, only 70,000 hector are currently accessible to Palestinian (Bregheith, 1998). The rangeland in Palestine faces serious challenges that threaten the pasture. (Dudeen, 2009). Rainfall variation, overgrazing, improper grazing time, uses of trees and shrubs as fuel source, and the cultivation of marginal land zone. In addition, the rangeland was neglected and the grazing pressure was increased, during the years of occupation, tremendously beyond the carrying capacity of this land. These factors lead to vegetation damage, decrease in productivity, increased in poisonous and unpalatable plants, severe soil erosion in many areas where soil becomes shallow and infertile and finally the threat of desertification (Mohammad, 2005). Halting the degradation of rangelands is urgently needed because of its social, economical, and environmental impacts (Mohammad, 2005). The implementation and monitoring of grazing systems would result in improved rangeland.



#### **2.3.4.2.4. Grazing system using in production systems**

A grazing system is defined as a specialization of grazing management that provides a desired outcome to rangelands by the manipulation of livestock (Society for Range Management 1974). A grazing system is the combination of pastures, livestock, fences, and management used to control forage production and harvest. The development of a grazing system should be flexible and dependent on the livestock producer's goals and resources. Grazing systems are divided into "continuous" or "rotational" stocked systems (Rayburn, 1992).

##### **2.3.4.2.4.1. Continuous grazing system**

Continuous grazing has been the traditional method. Continuous grazing is a method of grazing livestock on a management unit for a full year or during the growing season with no non-grazing periods (Holechek et al. 2004). Continuous grazing is a one-pasture system where livestock have unrestricted access throughout the grazing season (Blanchet et al, 2003). Advantages of continuous stocking are low fencing cost, little daily management, and good animal gains per head when the stocking rate is correct. Continuous grazing usually leads to the overgrazing of specific areas due livestock selectivity and causing issues with fertility and weed control (Lemus, 2008).

##### **2.3.4.2.4.2. Rotational grazing system**

Rotational stocking where livestock are moved between pastures during the grazing season, concentrating their feeding on one pasture for a few days and then moving them to a new field that, is ready to graze (Rayburn, 1992). Rotational grazing involves fencing a pasture into several small area or paddocks. Subdividing the pastures is a good way to balance livestock needs with forage supply. Under this type of grazing system, the livestock graze the paddocks in a sequence and they are moved to a new paddock once the forage is ready for grazing (Lemus, 2008).

#### **2.3.4.2.4.3. Current management practices of extensive system**

In Egypt the flock of animal is movement from the range starts early in the morning at sunrise and they return at sunset. Bedouins usually settle around a well, from which their animals drink once per day after returning from the range or every other day depending on the season. Generally, during spring season while range plants are succulent, they usually offer no water to their animals. Animals are herded by girls and young boys. Then when animals return back from the range (Ahmed. et al.1999).

#### **2.3.4.2.4.4. Time and hours for grazing**

Getahun 2008 and Mengistie 2008 are saying that most farmers own private grazing land for morning and afternoon grazing. Most of rangelands in West Bank were open to farmer before Israeli occupation. After 1967, military restrictions have reduced the total area available for grazing (ARIJ, 1994). Farmers usually start grazing when certain plants begin to appear on rangelands, and the termination of grazing depends largely on the depletion of palatable plants and lack of drinking water (Abu-Zant et al., 2003).

#### **2.3.4.3. Source of water**

Water is a scarce resource in the Palestinian territories; its scarcity is a main source for the political conflict in the region. The main sources of water in the WB are: ground water (the most important source), surface water, water harvesting in form of cisterns, and the Jordan River. Unfortunately, Palestinians have been denied access to the later. Furthermore, Palestinians are not allowed to construct dams or to work on collective water harvesting techniques, therefore, serious consideration is given to the cisterns to harvest the rain fall water especially in the areas where there is no access to the water networks or in the rain-fed agricultural areas to be used for supplementary irrigation ( Janazerh 2007).The annual rainfall in West Bank varies from 50-700 mm per year with an average of 450- 500 mm. Five percent of the rainfall

goes back to the sea, 30-40% infiltrates to the ground water aquifers and 55-65% lost in the form of evaporate-transpiration (Abdel-Ghafour, et al., 2006). Janazerh 2007 shows that most of herders (66%) indicated that they are faced with water shortage and 70% are depending on cisterns and/ or mobile tanks in watering their herds. Only 27% of herders, 18% of them from Ubadiah, depend on water networks in watering their herds. The annual average water consumption per head is 3.23 cubic meters and the average price 11.3 NIS. So the annual average cost per head is 36.5 NIS.

#### **2.4. Herd of sheep and goats**

Sheep and goats were probably among the earliest animal species to be domesticated by man. They are of great importance as major sources of livelihood (Tembely, 1998). And contribute to the sustenance of landless, smallholder and marginal farmers (Adugna, 1998) especially to the poor in the rural areas throughout the developing countries (Devendra and Burns, 1983). Sheep and goats are widely distributed and adapted to a wide range of environmental diversity (EARO, 2000; Ibrahim, 1998). Sheep and goats are based in the dry area and dominate farm production. Economically, sheep and goat are the most important livestock in Hebron district; they form more than 25% of small ruminants in the West Bank (PCBS 2006). The main characteristic of sheep and goats Sheep and goats have short generation cycles and high reproductive rates which lead to high production efficiency (Rege, 1993). Sheep and goats ability to convert forages and crops and household residues into meat, fiber, skins and milk is high (FAO, 1981). Small ruminants are prolific and need only short periods to increase flock sizes after catastrophes or in periods of high prices and thus off-take rate can respond to price increases (Ngategize, 1989).

Sheep and goats are both herbivorous (plant-eating) mammals with hooved feet. The two species share many other similarities in their personalities and behaviors, but plenty of differences separate the sheep from the goats. They

serve as a living bank for many farmers, closely linked to the social and cultural life of resource poor farmers (Workneh, 2000) and provide security in bad crop years (Ehui et al. 2000). Generally sheep and goats are kept extensively in developing countries depending on low productive native breeds. Mainly, goat farming is for milk-meat production while sheep farming is for meat-milk production. (Keskin, 2003).Musa, 2001 say that main production of Sheep and goat is meat and milk contributing around 71% of milk production in West Bank and more than 85% of red meat production .the main milk production for Sheep and goat occurs between March and June (Bsharat, 2005).

In Palestine the most sheep breed is local sheep breeds (Awassi) represents 67% of the total sheep numbers in (2004/2005), while other breeds represents 33% (Table 5). In Hebron districts the local breeds are still the majority and represents 80%, while other breeds represent 20% (PCBS 2006). At the same time, the local goats' breed represents 80% of the total goats for the same period. In Hebron, local goats breed still represents very high percentage that exceeds 98% while other breed represents only 2% (PCBS 2006).

Table 5: Number of sheep and goats in Palestine territories and Hebron districts 2004/2005

District	Sheep			Goats			Total sheep & goats	PT %	WB %
	Local	Other	Total	Local	Other	Total			
Palestinian Territory	534,130	269,035	803,165	295,599	75,599	371,198	1,174,363	100	
	67%	33%	100%	80%	20%	100%			
West Bank	515,617	226,882	742,499	289,953	71,290	361,243	1,103,742	94	100
	69%	31%	100%	80%	20%	100%			
Hebron	170,255	41,935	212,190	80,952	1,240	82,192	294,382	25	27
	80%	20%	100%	98%	2%	100%			

Source: PCBS(2006), Agricultural Statistics (2004/2005)

The main kept goats are local or baladi goats, however Shami goats and cross breeds(hybrid) are found. Goats were considered to be destructive grazers contributing to the degradation of vegetation and soil. While the demand for meat is lower; goat milk and milk-products are highly appreciated as a subsistence supply for the owners, particularly as goat milk is highly digestible at time when sheep don't produce (Rolf Wachholtz 1996).

## **2.5. Special features of sheep and goats**

### **2.5.1. Awassi sheep**

Awassi sheep is used for range of products; meat, milk as well as wool and skins. ( Devendra &Faylon, 1989). Fat-tailed Awassi is the local breed of sheep in Jordan and is the most important breed in the semi-arid regions of the near east countries (Epstein, 1985). It has several desirable traits such as the popularity of its meat and milk and the high adaptability to different ecosystems. Resistance to diseases, tolerance to extreme temperatures, ability to walk long distances for grazing, strong flock instinct, and endurance of adverse management and feeding conditions have encouraged sheep producers to raise this breed (Thomson et al., 2003). However, a negative characteristic of the Awassi breed is low fertility (Hamadeh et al., 2001). Under natural conditions, the Awassi sheep breeding season occurs during the summer and fall (Epstein, 1985). Mating mostly occurs between late June through early September, allowing ewes to lamb between late November and early February (Thomson et al., 2003). Breeding ewes before this period results in lambing before the cold winter months. Seasonal reproduction in sheep is mainly regulated by photoperiod through melatonin secretion along with other environmental factors such as temperature, nutrition, and social relationships (Arendt, 1998).

### **2.5.2. Assafi sheep**

The Assafi sheep under intensive management are high milk producers. Dairy ewes produced an average of 380 liters of milk during a standard lactation of 210 days (Carasso, 1979). Other, an average Assaf ewe kept under this intensive management regimen was found to produce 334 L of milk during 173 day lactation. Mean litter size was 1.57 lambs/ewe lambing, and lambing interval was 272 day. Milk production was affected by litter size; with twin- and triplet-bearing ewes producing approximately 20% more milk per lactation than single-bearing ewes (Pollott, et al., 2004). The Assaf sheep are characterized by their ability to produce high twins (Gootwine et al., 2001). The Assaf sheep have the capacity to adopt with the environment found in the Palestinian territories, so it is kept beyond production systems such as the intensive and semi-intensive and traditional. (N. Sinjilawie & M. Nori, 2000).

### **2.5.3. Domestic Goats (black goats)**

Black goat is also known in Palestine as Mountain, Black and Balady (Local) goat. It is indigenous in Jordan and other Middle Eastern countries such as Syria, Palestine, Lebanon and Iraq (Devendra, et al., 1984). This breed presents in all locations of Palestine. Black goat usually appeared in black (45%) white (20%) and dark brown color (23%). However, gray and random unrepeated mixed colors could be seen in this goat breed. Udders of Mountain goat tend to be well developed (70%). However, spherical udder could be seen among Mountain goat.

The value of mature body weight of Mountain breed is 46 kg and ranges from 25 to 70 kg. The head of Mountain goat was medium in size. Horns and wattles present in 60% and 35% of the population, respectively. Horns of adult males are strong, moderately heavy, long, homonymous twisted and projecting sideways or backward and outwards, while females have lighter, scimitar shaped and backward curving horns, and also twisted homonymously. Nose shape of Mountain goat tends to be straight and slightly convex. Ears were

large or medium in size. However, small and trace ears could be noticed among some individuals. Nearly the same descriptive status of the head and its related characteristics for Mountain goat were reported in Jordan and Syria (Al-Khoury, 1997; Harb & Khaled, 1984; Hassan & Shaker, 1990).

#### **2.5.4. Shami goats (Damascus goats)**

The Damascus or Shami goat originates in Syria, but it has spread to a number of countries of the Near East. It is believed to have given rise to the Zaraibi goat of Egypt and to be an ancestor of the Killa breed of Turkey (Devendra, et al 1987). The Damascus breed has high prolificacy and milk yields, combined with adaptation to hot environments. It has been identified as having great potential in the Near East (FAO, 1987).

Shami goat is generally brown, dark brown and white in color, with convex nose shape and long ears. The head is long with a Roman nose and the presence of horns in both sexes is associated with inter-sexuality (Hancock and Louca, 1975). Fertility is medium to high (80% to 90%), a characteristic of most goat breeds with high milk production. The prolificacy of the breed is among the highest in the region averaging 1.80 kids per doe kidding (Constantinou et al., 1981). Live weights at those ages range from 42 kg to 54 kg depending on the type of birth (Mavrogenis, 1988 ).Shami is originated in Syria and it is imported to Jordan due to its high productivity of milk and twins (Sawalha, 1998). Total milk production, including milk produced until weaning, ranges between 350 kg and 650 kg per goat per lactation (Louca et al., 1975).

#### **2.6. Economic assessment of sheep and goats**

Animal products are considered to be one of the most important sources of human nutrition. It provides the body with the essential proteins for growing in addition to minerals, vitamins and fat. The level of consumption of animal products could be used as an indicator for the level of development that a

community achieved or at least could be used as indicator for the country income levels (Shqueir, 1991).

Production by livestock species in many areas are different in markets due to differences in resource, endowment, climate, population, disease incidence, level of economic development, research support and government economic policies (Beets *et al.*, 1990).

The main production of sheep and goats is meat and milk, contributing around 71% of milk production in the West Bank and more than 85% of red meat production (Musa 2001). Fertility is the percentage of breeding females that give birth per flock. The potential meat production is characterized by the productivity of the breeding females. The main milk production for sheep and goats occurs between March and June (Bsharat 2005). The reproduction cycle of sheep and goats starts in June / August. This period is called the mating season and five-months of gestation. Lambing or kidding starts in December /January (Bsharat 2005).

The average milk production per ewe or goat as estimated by PCBS for 2004/2005 season is still much lower than it should be (Table 6) shows that total ewes' milk was 56220 tons and the goats' milk was 31181 tons. If we assumed that the number of productive ewes and goats represents 75% of the total numbers of sheep and goats. This means that the number of productive ewes for 2004/2005 was 602373 heads and the number of productive goats was 278398 heads. So the average annual milk production per head was 93 kg per ewe and 112 kg per goat. These averages are below the known average for local breeds in PT which estimated by 100 liters per year/ ewes and 120 liters per year/ she-goat (Shawahni, 2005). While the Average yield per Assafi ewe is 350 liter per year and the average yield per Shami goat is 250 liter per year (Shawahni, 2005).

In spite of that, ewes and goats are the main source of milk in PT. It represents 47% of the total milk production of the PT and 51% of the WB



production. On the districts level, it represents 44% of Hebron production (PCBS, 2006). Dairy products of sheep and goats are marketed directly from producers to consumers. Milk is processed to several products by the herders in their houses.

Table 6: Milk production in PT and Hebron district at 2004/2005 (metric Tons).

	<b>Cow milk</b>	<b>Ewes milk</b>	<b>Does milk</b>	<b>Total</b>
<b>PT</b>	99472	56222	31181	186875
	<b>53%</b>	<b>30%</b>	<b>17%</b>	<b>100%</b>
<b>WB</b>	78022	51975	3044	160341
	<b>49%</b>	<b>32%</b>	<b>19%</b>	<b>100%</b>
<b>Gs</b>	21450	4247	836	26533
	<b>81%</b>	<b>16%</b>	<b>3%</b>	<b>100%</b>
<b>Hebron</b>	27533	14853	6904	49290
	<b>56%</b>	<b>30%</b>	<b>14%</b>	<b>100%</b>

Source: PCBS, 2006. Agricultural Statistics 2004/2005

Meat production, in Palestine it was found that mutton represents 29% of meat production and 85% of red meat production in PT (Table7). On the study area level, it represents 32% of all meat production and 86% of red meat production in Hebron district (PCBS, 2006).

Table 7: Meat Production in PT in 2004/2005 (metric tons)

	<b>Beef</b>	<b>Mutton /Sheep</b>	<b>Mutton / Goat</b>	<b>Chicken</b>	<b>Total</b>
<b>PT</b>	5228	22882	7691	69090	104891
	<b>5%</b>	<b>22%</b>	<b>7%</b>	<b>66%</b>	<b>100%</b>
<b>WB</b>	4211	21154	7458	41863	74686
	<b>6%</b>	<b>28%</b>	<b>10%</b>	<b>56%</b>	<b>100%</b>
<b>Gs</b>	1017	1728	206	27227	30178
	<b>3%</b>	<b>6%</b>	<b>1%</b>	<b>90%</b>	<b>100%</b>
<b>Hebron</b>	1306	6045	1703	15198	24252
	<b>5%</b>	<b>25%</b>	<b>7%</b>	<b>63%</b>	<b>100%</b>

Source: PCBS, 2006. Agricultural Statistics 2004/2005

The value of sheep and goats' meat and milk products in PT in 2004/2005 was US \$ 202,874,000, representing 54% of the value of all kinds of milk and meat

produced in PT including chickens, beef, mutton and all cows' and small ruminants dairy products(PCBS, 2006).

The value of mutton production represents 57% of the total value of sheep and goats production (Table 8) while value of dairy production represents 43%. The value of Palestinian imports of meat, in 2004, was US \$24.381 million; 17.028 million of it was from Israel (PCBS, 2006).

Table 8: Value of sheep and goats meat and milk products in PT in 2004/2005  
(US \$ 1000)

<b>Governorate \ District</b>	<b>Meat (Sheep and goats)</b>	<b>Milk (sheep and goats)</b>	<b>Total (Meat and Milk)</b>
<b>PT</b>	116,346	86,528	202,874
	<b>57%</b>	<b>43%</b>	<b>100%</b>
<b>WB</b>	109,060	81,496	190,556
	<b>57%</b>	<b>43%</b>	<b>100%</b>
<b>Hebron</b>	29,418	21,540	50,958
	<b>58%</b>	<b>42%</b>	<b>100%</b>

Source: PCBS, 2006. Agricultural Statistics 2004/2005

## **2.6. Marketing factor**

Market is a very important economic factor in sheep production. They directly determine the trend and scope of production, marketing includes moving products from producers to consumers and comprises exchange activities of buying and selling, the physical activities designed to give the product increased time, place and form utility, and the associated functions of financing, risk bearing and dissemination of information to participants in the marketing process (Jabbar *et al.*, 1997).Marketing of sheep and goats is characterized by strong seasonality and subject to fluctuation. Demand and price increases during festival periods. Factors affecting market supply, as measured by the number offered, include high demand during religious festivals, lambing season, quality and quantity of grazing, as well as cash needs for crop inputs and, later, for food purchase before harvesting (EARO, 2000).

### **2.6.1. Market location**

In Ethiopia, market locations (primary and secondary) markets are usually not fenced; there are no permanent animal routes and no feed and watering infrastructures. Yet buyers and sellers are subjected to various service charges by the local authorities as well as other bodies (Ayele *et al.*, 2003).so It is essential to consider linking production, products and by-products to markets in the context of the production to consumption systems in the 'food or commodity system framework' or commodity production and marketing chain (Devendra, 2007). Associated with the production to consumption markets is the need for a proactive agribusiness orientation (Devendra, 2007).

The description of market locations and condition is restricted to the most frequent input and output markets. The provincial market of these trade volumes of livestock products and feed-stuffs are by far the main trading centers (Rolf Wachholtz 1996).

The sheep and goats feed-stuff markets are linked. The marketing places are located in the center. Food, household items, clothing, etc., need by sheep and goats owner's families are also available in this market. The market locations are far from the sheep and goats farming locations and the difficulty and constraints (Quasmeh, 2003). Cheese and milk are sold to small privet dairy shop or to consumers (Quasmeh, 2003 and Horizon 2009).

### **2.6.2. Market forms and price**

The main revenue forms the sheep and goats production unit generated by lamb and kid production (off-spring) and milk and milk products. The revenue form lamb and kid production is the main determining factor for the gross margins of sheep and goats enterprises. The most important parameter for assessing the success of breeding female sheep or goats is productivity rate, weight of the lamb or kids, sold the milk of-take and the market prices for these products (UAWC 2008 and Horizon 2009). A gross margin calculation

is carried out by Quasmeh, (2003), for the activity of transforming milk into cheeses, yoghurt, jamid, and clarified butter (Arabic butter or ghee).

The origin of milk is mainly from sheep but is mixed with some from goats. The revenue is determined by the quantity of cheese, jamid, and Arabic butter, and their respective price. The price for high quality Arabic butter and jamid is used. The main variable cost is forgone opportunity to sell milk. Other cost, for salt, enzymes, energy and transport, are very minor. The main benefit in the production of yogurt is seen in the fact that it can be kept longer than milk (Al-jabari 2010).

## **2.7. The profitability in the sheep and goats**

Livestock marketing involves the sale, purchase or exchange of products such as live animals, and livestock products of milk, meat, skins, wool and hides for cash or goods in kind (ILCA,1990). Most of the milk produced by these animals is transformed to cheese in industrial and artisan enterprises. The rest is made into a variety of traditional products (including yoghurt). Meat production is mainly orientated around lambs and goat-kids, which are sold young, at low weights and relatively high prices (Zervas *et al.*, 1999). In addition that milk produce such as Butter, Cheese, Ghee, e.t.c. The milk market from sheep and goats has essentially many facets (Haenlein, 1996): home use, gourmet interest, natural food stores, distinguished restaurants, medical needs. The main cost factor in the husbandry of sheep and goats are feeding cost; these represent more than 70%. The replacement cost of breeding ewe or doe and mortality are variable cost factor ranked second. The minor costs are water consumption, veterinary, shepherd and transportation ( UAWC 2008 ).

### **3. Methodology**

#### **3.1. Introduction**

This study was conducted from January 2008 till December 2008 in order to assess production systems in sheep and goats at Hebron in west-Bank. This study focuses on the assessment of socioeconomics, environment, rangeland, input and output of sheep and goats products. In order to gather the necessary data, the researcher utilized the descriptive method, using both qualitative and quantitative approaches. In order to achieve the purpose of the study, the researcher used a questionnaire. Moreover, the researcher chose some farmers to evaluate the type of production systems in sheep and goats. The data of the survey were processed by computing the percentage of each survey item. Relevant literatures were also used to support the findings. The credibility of findings and conclusions extensively depend on the quality of the research design, data collection, data management, and data analysis. This chapter presents the description of the study site, methods, and procedures. In this research, the researcher used the descriptive method to gather information about the present existing condition. The purpose of employing this method is to describe the nature of a situation, as it exists at the time of the study and to explore the causes of particular phenomena.

#### **3.2. Research Method**

In order to achieve the purpose of the study, the researcher used a qualitative and quantitative approach. The qualitative method permits a flexible and iterative approach, while the quantitative research method permits specification of dependent and independent variables and allows for longitudinal measures of subsequent performance of the research subject.

### 3.3. Research Instrument

The researcher designs a self-administered questionnaire for the data gathering process to get qualitative and quantitative data. The primary aim of the questionnaire is to determine the cost of input and output including; feed-stuff, milk and other product, and then compare the analysis of the three production systems in sheep and goats. This questionnaire consists of a mixture of closed questions and more open comments. The secondary aim of the questionnaire is to determine the effects of socio-economical factors, and opportunities of production including ;age , family social status, location, houses, material used, land tenure,...etc.

### 3.4. Study area

#### 3.4.1. Description of the study area:-

The study was conducted from January 2008 till December 2008, at Hebron Districts in four locations; Bani-Na'im, Sa'ir, Halhul, and Beit-Ummar, as seen in (Figure 1).

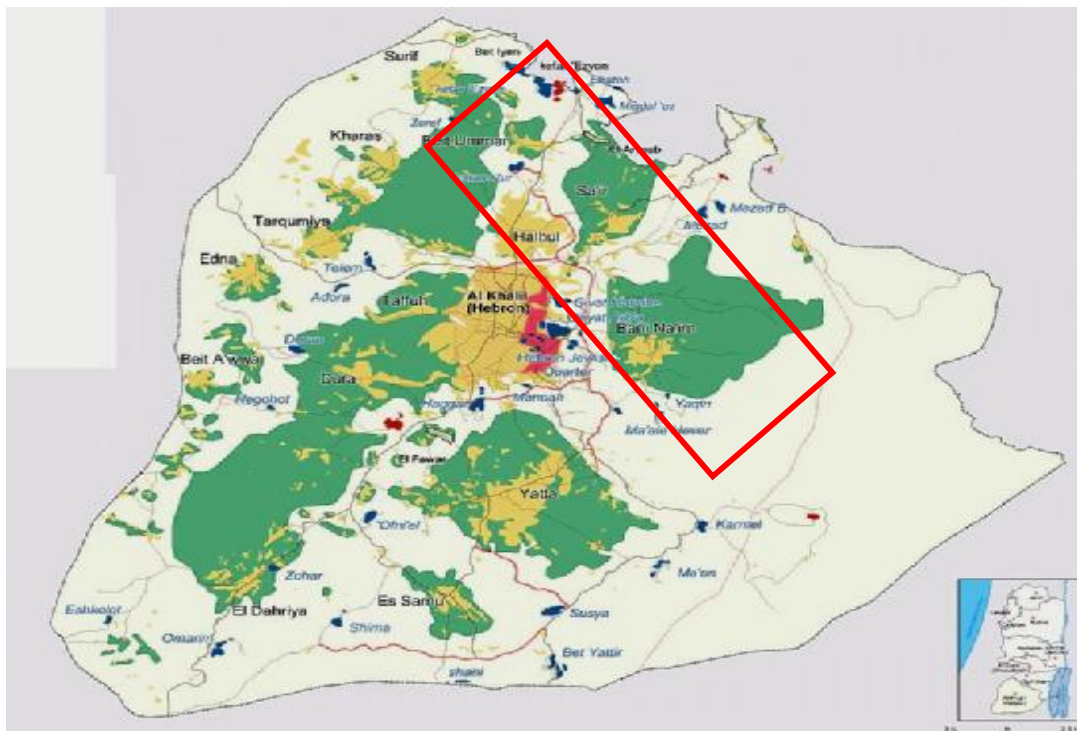


Figure 1: Map of Hebron district, with designated of the study area

The total area of Hebron District is about 997 km<sup>2</sup> and the population is about 552,164 inhabitants (PCBS, 2008). The Hebron district area is located between the 31° 32' 0" north latitudes and longitudes 35° 5' 0" east of Palestine. The annual mean rainfall is about 450-600mm overall Hebron District, and occurs in a bimodal pattern with small rains between March and April, and main rains are from December to February. The annual mean temperature is 18-27.2 °C in the hot months and 8.6- 13.7°C in the cool months. The mean relative humidity is 61.75% (MP, 2008).

The statistic shows that, the distribution of sheep and goats in Hebron district is more than 21% of sheep and 20% of goats of WB are in Hebron district (fig.2&3)( PCBS 2007), and more than 70% of sheep and 60% of goats in north and north-eastern of Hebron districts in the study area (fig.4&s)(ADOH, 2007).

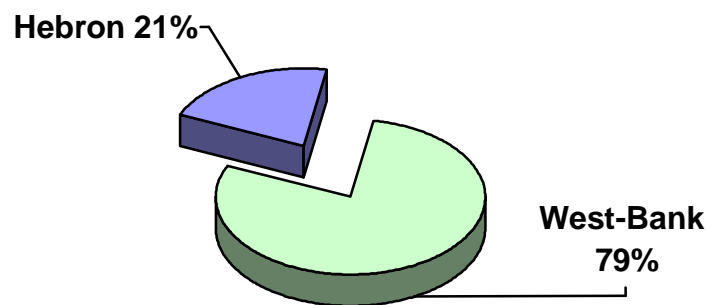


Figure 2: Percentage of sheep distribution at West-bank and Hebron.  
Source: Agriculture Department of Hebron, 2007.

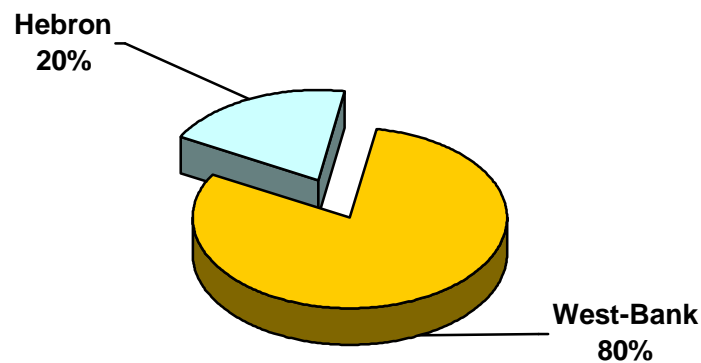


Figure 3: percentage of goat's distribution at west bank and Hebron.  
Source: Agriculture Department of Hebron, 2007.

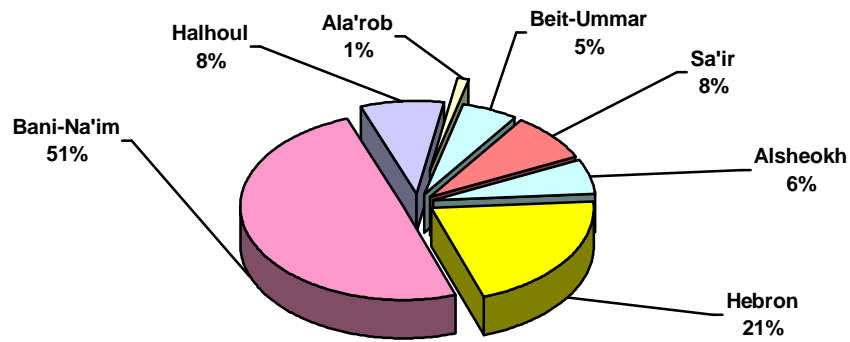


Figure 4: percentage of sheep distribution at Hebron district.  
Source: Agriculture Department of Hebron, 2007.

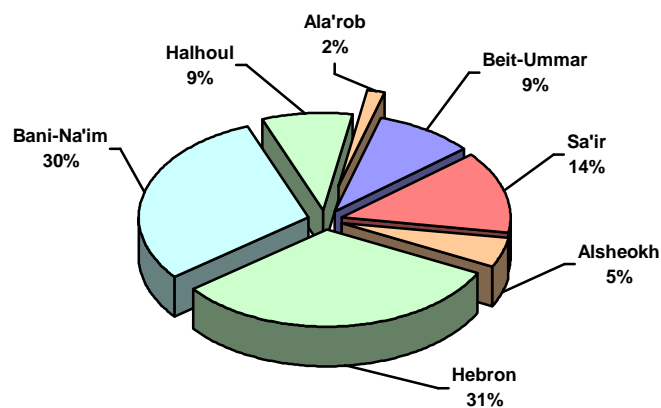


Figure 5: percentage of goats distribution at Hebron district.  
Source: Agriculture Department of Hebron, 2007.

The research was conducted at four locations; the first in Bani-Na'im which is located at 8km east of Hebron city. The amounts of annual rainfall range between 250-450 mm, elevation 951 m above sea level, the secondary location is Sa'ir which located to the north-east at 8 km of Hebron city, the amount of annual rainfall also between range 250-450 mm, but the elevation 870 m above sea level, third location Halhul which is located at 5km north of Hebron city, elevation 1027m above sea level, but amount of annual rainfall between range 350-500 mm, the last location Beit-Ummar which 8km north of Hebron city, elevation 987 m above sea level, The amount of rainfall range between 350-500 mm.( MP,2008).



### **3.4.2. The reason for selecting these sites**

Three production systems of sheep and goats are focused in this area, so that some characteristics are shared, including:

- The average annual rainfall from 250 mm to 500 mm. the annual rainfall pattern is highly erratic.
- Sheep and goats and cereal production are the most important farm activities.
- Rangeland is used in production systems of sheep and goats.
- Sheep and goats is the most important farming activity on the farmer families.
- Land Tenure: lands owned by landlords and some users of this land are not always the owners (Tenants or republication).
- The most sheep breeds reared are mainly, Awassi and Assaf, and the main goats breeds are Shami, local goat (baladi).

### **3.5. Survey and data collection**

#### **3.5.1. Informal survey**

The primary information about sheep and goats production systems was obtained from several national and international institutions, including: Hebron University, Palestine Ministry of Agriculture (PMoA), Agriculture department of Hebron, Palestine Center Bureau of Statistics (PCBS), books and pamphlets for the production of agricultural sheep and goats, previous studies on the production systems of sheep and goats, Palestinian Meteorological Department in Hebron (MDP).

Data collection was based on field survey and the complementary collection of secondary information which covered sheep and goats and general statistics on the nation level. An informal survey was carried out in order to get a better

understanding of the systems before the final design for the formal survey was decided. This also helped with the interpretation of the collected information. The objective of the informal survey was to understand farmers' perceptions, behavior, base and management of resources, constraints and opportunities of production, so the following formal surveys would have better design.

### **3.5.2. Formal survey**

One questionnaire was used to collect data. The questionnaire was submitted to a group of experts in different fields – economist, vet, developmental expert, and sheep and goats husbandry expert- to review and give feedback for reliability and validity. After that, the questionnaire was coded to be suitable for processing by using the SPSS program. After the approval it was translated into Arabic. The translated version was also submitted to the supervisor for his checking and approval.

The questionnaire was comprehensive and covered all items that were related to the production systems of sheep and goats and their owners. The questionnaire was structured in such a way that respondents will be able to answer it easily, and so the questionnaire consisted of 10 sections including about 60 questions. The questionnaire consists of the following sections:

- ✓ **Personal Information:** It includes general questions about the questionnaire and interviewee such as, name of data collector , name of study area ,name of farmer and address and number of telephone if found, date of interview and interviewer name.
- ✓ **The general Information of the farm owner and his family:** It includes gender, age, educational level, marital status, number of family.
- ✓ **The daily work in farm:** the most important day-to-day practices include feeding, watering, milking of animals, processing of milk, grazing and treatment of animals.

- ✓ The type of production system: to determine whether the production system is; intensive, semi-intensive, and traditional or extensive.
- ✓ Feed and barns: it includes the type of barns, the type of concentrate ratio, and the type of roughage.
- ✓ Infrastructure and equipment used in the farm: such as; land tenure, Infrastructure of barns, feeder, drinker, water and feed resource.
- ✓ Animals in farms: it includes; breeds of animal, numbers, type and price.
- ✓ The rangeland and grazing management: such as questions about the reliance on grazing as a source for the herd feeding, time and hours for grazing , grazing systems , number of days for grazing , the constrains of grazing.
- ✓ Sheep and goats economics: This section is composed of two subsections related to inputs and outputs of the sheep and goat production.
- ✓ Input and output items (quantities, prices and cost).The first subsection includes information about input of sheep and goat such as animal feeding, water, veterinary service and medicine, labor, and transportation. The second subsection is about the production output.

### **3.5.3. Study Sample**

The sample of study consists of 150 farmers who own sheep and goats. The sample was selected randomly. The sample of the study consists of 23% of the farmers who own sheep and goats in the study area. The interviewed sample was 60 owners in Bani-Na'im, 25 owners in Sa'ir, 33 owners in Halhoul, and 32 owners in Beit-Ummar, which represents 40%, 17%, 22%, and 21%; respectively. It was selected based on the numbers of sheep and goats owners in these locations.

### **3.5.4. Data collection**

The primary and secondary data were used in the research. After that the questionnaire was tested in the field for validity and stability. And then data was collected from short visits and interviews with farmers, but the interviews were administered in person for proper probing.

### **3.6. Data analysis**

The survey and relevant secondary data were organized, summarized and analyzed by using SPSS statistical package, added to the use of Excel. Means and percentage values of various parameters were calculated and compared between the three production systems of sheep and goats in the studied locations in Hebron. And then it compares and analysis the profitability between the three production systems.

### **3.7. Determinants of the research**

1. Shortage textbooks, references and publications at the university, libraries.
2. Some farmers were not responding to answers the questions research.
3. The absence of previous studies on this subject.
4. The most important problem during the data collection were avoided some farmers to give information and this led to a long period of collection data.

## 4. Results

### 4.1. Distribution of sheep and goats owners in study area

The questionnaire survey shows that 52.6% owners of sheep and goats at the extensive production system are present in Bani-Na'im which depends on rangeland and by-product (plant residue) and some time concentrate feed in market. Also the study shows that 28% owners of sheep and goats at the semi-intensive production system are present in Halhul which depends on concentrate feed and rangeland or forage purchased form market when grass decrease in rangeland. High percentage of owners at the intensive production system is present in Bani-Na'im 47%. In this production system, the sheep and goats depend on the market to fodder concentrate or forage. The distribution of production systems is different from place to place between the study areas according to the three production systems (Table 9)

Table 9: Distribution of sheep and goats owners according to the three production systems in the study area.

Production systems Study area	Bani-Na'im N(60)	Sa'ir N(25)	Halhul N(33)	Beit-Ummar N(32)	Total N(150)
<b>Traditional %</b> n(38)	52.6	15.8	13.2	18.4	100%
<b>Semi-intensive %</b> n(57)	24.6	21.0	28.0	26.4	100%
<b>Intensive %</b> n(55)	47.3	12.7	21.8	18.2	100%

Source: fields 2008

### 4.2. Socio-economic factor

Socioeconomic factors are great importance in the production systems for understanding processes and procedure of decision making regarding management of production systems, such as; family size, gender , age ,experience, profession and education of sheep and goats owners, , daily business particles, land tenure, sheep and goats breeds, house ,grazing.

## 4.2.1. Human resources

### 4.2.1.1. Family size

The average of family sizes is 10.20 members as shown (Table 10), according to the production system at sheep and goats. The average of males per family is 5.20 which represent 51% and the average of females is 5.00 which represent 49%.

Table 10: Average of family size for the farm owner in the study area

<b>N=150</b>	<b>Mean Persons</b>	<b>%</b>	<b>Std .Deviation</b>
Family size	10.20	100	6.408
Male	5.20	51	3.602
Female	5.00	49	3.078

### 4.2.1.2. Family member's classification

The survey data revealed that more than 67% of family members are children or students, 15% worker, 11% married, and only 7% are in University (fig. 6)

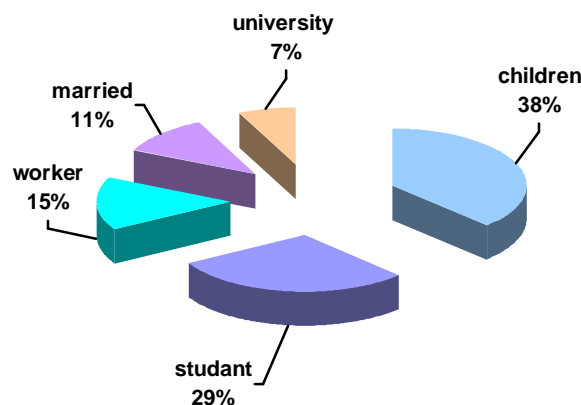


Figure 6: The percentage of the family member classification in study area.

### 4.2.1.3. Gender distribution of the farm owners

The study shows that the largest number of farm owners is males, as 81% irrespective of the production system. Also it shows that the highest percentage for female is present in the intensive production 27% then extensive 21 % (Table 11).

Table 11: The percentage for gender of owners according to production system

Gender	all systems %	Intensive %	Semi intensive %	Extensive %
Male	81	73	90	79
Female	19	27	10	21
Total	100	100	100	100

#### 4.2.1.4. Age distribution of the farm owners

The owners of the farms were divided into four groups according to age as follows: 70<, 50 -69, 30 - 49, and 29> (Table 12). The data shows that the majority of the farmers in the three production systems were within the age bracket of 50 to 69. The extensive system had no owner less the age of 29 years. While the age of groups (70 <, 30 - 49) are fluctuates in the three production systems between 17% and 33%, respectively of the farm owners.

Table 12: The percentage of the farm owners according to age in study area.

Years	All systems %	Intensive%	Semi-intensive %	Extensive %
70<	17	14	18	21
50-69	48	46	51	46
30-49	33	38	28	33
29>	2	2	3	0
Total	100	100	100	100

#### 4.2.1.5. Experience of the farm owners

Only 5% of the farm owners have 9 years experience or less in rearing sheep and goats (Table 13). 48% have experience of 10-14 years, and 33% have 25-49 years of experience.

Table 13: The percentage of farm owners according to experience in three PS

Years	All systems %	Intensive%	Semi intensive %	Extensive %
50<	14	14	13	18
25-49	33	27	33	41
10-24	48	54	46	41
9>	5	5	8	0
Total	100	100	100	100

#### 4.2.1.6. Main profession of the farm owners

The data shows that 40% of sheep and goats owner's main profession was farmers, (Table 14) followed by worker which represent 30% and housewives that represent 18% ,while only 11% employee of the farm owners but the percentage of student is very low. The results show the percentage of the main profession of sheep and goats owners in the three production systems is different. It is 54% in the extensive production was farmers, while the highest percentage of housewives was in intensive production, but the highest percentage of worker is found in semi-intensive.

Table 14: percentage of the main profession for farm owner at in three PS

<b>profession</b>	<b>All system %</b>	<b>Intensive %</b>	<b>Semi-intensive %</b>	<b>Extensive %</b>
farmer	40	27	44	54
Housewives	18	27	8	20
employee	11	14	8	13
worker	30	32	38	13
Student	1	0	2	0
Total	100	100	100	100

#### 4.2.1.7. The educational level of the farm owner's

Data shows that the percentage of farm owner's education is elementary 45%, Illiterate 27 % and High school 21 %, while only 7% of the farm owner's have University education . The highest percentage is farm owners who finished high school is 27%, they work in the intensive production system. On other hand, the highest percentage of illiterate was found in the extensive production system, 38 % (Table 15)

Table 15: The percentage of education level for the farm owner's in three PS

<b>Education</b>	<b>All %</b>	<b>Intensive %</b>	<b>Semi-intensive %</b>	<b>Extensive %</b>
Illiterate	27	14	33	38
Elementary	45	51	38	46
High school	21	27	21	12
University	7	8	8	4
Total	100	100	100	100



## 4.2.2. Management resources

### 4.2.2.1. The labor distribution according to gender in the PS

The study shows that 55% of labor is male, while 45 % female (Figure 7).

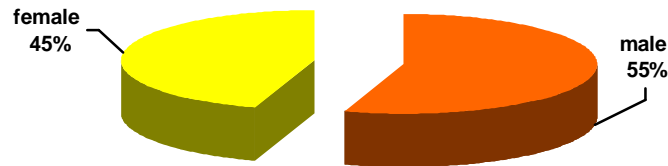


Figure 7: The percentage of the males and females at the daily business particles.

### 4.2.2.2. Responsibilities & work distribution among the farm members

The study shows that milking and milk processing are mainly done by females while grazing is the male task. Around 64% of farmers said that milking is the responsibility of females and 100% said that milk processing is also the task of wives and daughters. But in case of herd grazing and treating , 98% of farmer said that grazing is done by themselves and/ or their sons in other hand only 5% of farmers said that treating is done by wives and daughters but 95% of treating done by themselves. Watering and feeding are shared by male and female but the male share at high portion 64%, 65 %( fig.9).

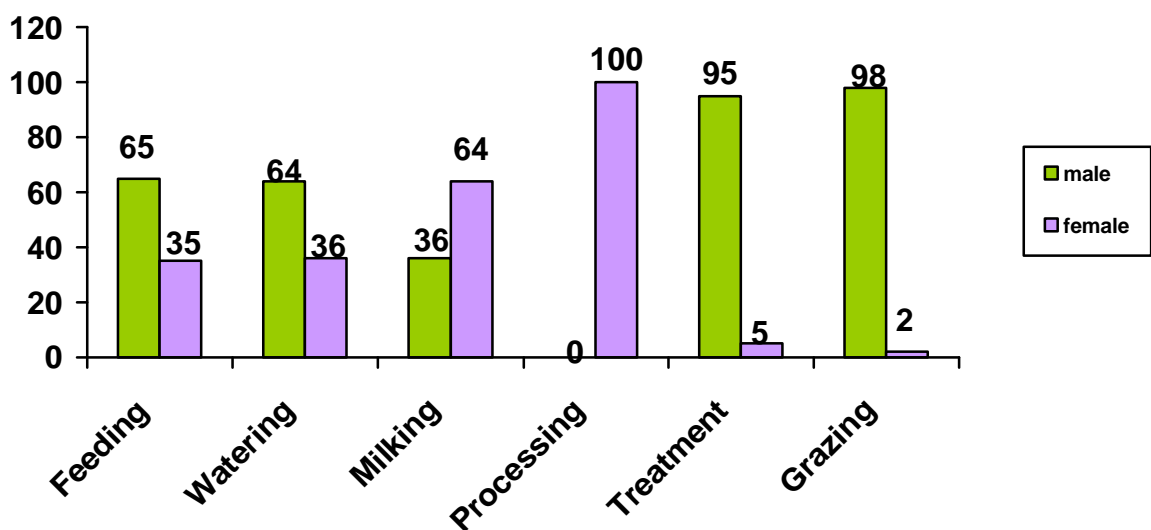


Figure 8: The percentage of responsibilities & work distribution among farm members

### 4.2.3. Economical resources

The study compares between the three production systems in Sheep and goats, it included; barn types and construction material used, feed stuffs, Land ownership/tenure status, types of the feeder and drinker materials, and water source.

#### 4.2.3.1. The barns types and constructions material

Most of barns, if not all, are constructed randomly without any consideration to the proper design such as direction, height, ventilation, size, area per head, kind of floor and separators. This study shows that about 8% of farmers put their herds in opened barns without any shelter in the semi-intensive production system. In the extensive production system 20% put their herds in caves, and another 50% put their herds in semi-open barns. But in the intensive production system 93% of farmers put their herd in closed barns or stores under their residence (Table 15). And the most of construction materials that used in barns are cement, where in extensive production 94% of materials is cement, in semi-intensive production 17% of construction materials are stone (Table 16). The cost of closed Barn is 35JD /m<sup>2</sup> if built with stone, but 15 JD/ m<sup>2</sup> if built with cement, while the cost of the open barns is cheap about 9JD/ m<sup>2</sup>.

Table 16: The percentage of barns types and constructions material in animal at three PS

Type of housing	Intensive %	Semi-intensive %	Extensive %
Closed barns	93	46	28
Semi-open barns	6	44	50
Open barns	1	8	2
Cave	0	2	20
Total	100	100	100
Building material			
Stone	13	17	6
Cement	87	83	94
Total	100	100	100

#### 4.2.3.2. The feed resources of sheep and goats in three

The result shows that the feed resources are 75% of farm owners purchase the feed from private merchants at the market, 14% of farm owner's obtains the feed from the family land and private merchants from market together. In other hand, 8% of farm owner's obtains the feed from the family land only, 2% of farm owner's obtains the feed from cooperative societies and 1% of farm owner's obtains the feed from other sources (Figure 9).

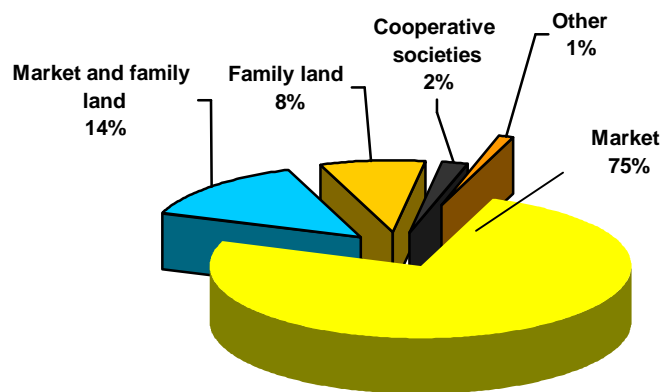


Figure 9: The percentage of feed resources of animals in 2008 at the study area.

#### 4.2.3.3. Feed- stuffs

Feed ingredients substitute one another. Feeding programs should take into consideration; supply energy, forms of the feed, animal requirements, feedstuff availability, and the cost of feed. The feed is divided into two types concentrate and roughage.

The result shows that 26% of concentrate ratio is present in the intensive production, but the highest percentage of barley grain is present in the extensive production 35%, while wheat bran in the three production systems is present at nearly the same percentage. On the other hand, about 90% of the pasture is used in the extensive, and 29% in the semi-intensive, straws is high in the semi-intensive production, but 49% of vetch and 39% of Lucerne are present in the intensive production (Table 17).

The average of the quantity of concentrate which is provided to animals per day is around 600 g/head/day in the extensive production system, and the average of the annual cost of this quantity is based on the prices of the first half of 2008, it is around 75JD. However, in the semi-intensive system, it is around 1100 g/head/day and the average of annual cost is around 98 JD. While in the intensive, production system is around 1500 g/head/day and the average of annual cost is around 133 JD. The average of annual cost per head of roughage is around 6, 21, 36 JD, in the extensive, the semi-intensive, and the intensive production system respectively. The farmers also said that in the extensive and semi-intensive systems, animals feed on the concentrate ratio of six to nine month, but in the all days of the year the animals feed on the concentrate ratio in the intensive production.

Table 17: the percentage of feedstuffs according to production systems in sheep and goats at 2008

<b>Feed-stuffs</b>	<b>Intensive%</b>	<b>Semi-intensive%</b>	<b>Extensive%</b>	<b>Cost JD/Ton</b>
<b>Concentrate feed</b>				
Concentrate ratio	26	20	14	377
Barley grain	24	25	35	283
wheat bran	21	20	19	264
wheat grain	12	16	20	274
Maize	11	15	10	283
Other	6	4	2	
%	100	100	100	
<b>Roughage</b>				
pastures	0	29	90	-----
Straws	10	48	3	200
Vetch	49	5	1	215
Lucerne	39	8	5	227
Crop residue	2	10	1	-----
%	100	100	100	

#### **4.2.3.4. The pasture in the extensive and semi-intensive PS**

##### **4.2.3.4.1. Reliance on grazing as a source of sheep and goats feed**

About 44% of the interviewed farmers in the semi-intensive production system declared that grazing covers less than 10% of their animals need. In the extensive production about 36% of farmers said that it covers between 10-

20% of the need and 26 % of farmers in the extensive production said that it covers 21-30% of the need. The rest that represents 28% of farmers in the semi-intensive production said it covers more than 30% of their animals feed (Table 18).

Table 18: The percentage of the pasture quantity according to PS

<b>place of grazing</b>	<b>All %</b>	<b>Semi-intensive PS%</b>	<b>Extensive PS%</b>
10= >	34	44	24
11-20	23	10	36
21-30	22	18	26
31= <	21	28	14
total	100	100	100

#### **4.2.3.4.2. Grazing area**

The result shows that 24% of farmers are grazing around their residence in village while 58% of farmers in the extensive production system are moving within the area or in mountains. About 16% of the semi-intensive production and 8% the extensive system of shepherds are returning back to their houses, while 12% of them depend on availability of vegetation in all of above (Table19).

Table 19: the percentage of grazing areas according to the production systems

<b>Grazing area</b>	<b>All %</b>	<b>Semi-intensive PS%</b>	<b>Extensive PS%</b>
Around village	24	22	26
Mountainous	54	50	58
Orchards	12	16	8
All of the above	10	12	8
Total	100	100	100

#### **4.2.3.4.3. Grazing Season**

There is no specific norm for farmers in grazing their herds. About 62% of farmers in the extensive production system are grazing their animals all the year round regardless of the availability of grass or not. While 38 % in the extensive production are grazing all the year except in winter season and about 36% of farmers in the semi-intensive production graze animals in spring

until the half of summer, 19% of farmers in the semi-intensive production graze animals only during spring (Table 20).

Table 20: Number of month for grazing animals in production systems

<b>Number of month</b>	<b>Semi-intensive PS%</b>	<b>Extensive PS%</b>
10-12	26	62
7-9	19	38
4-6	36	---
3=>	19	---

#### **4.2.3.4.4. Time and the grazing Method**

Farmers said that the best time for grazing is in morning at 7 am then return to home for break and then go to pasture at 3pm and return at 7pm to home. The time for grazing is about 7 hours for the semi-intensive production and 9 hours for the extensive production at spring and summer.

Data shows that about 83% of farmers used traditional grazing in the extensive system, while 19% of farmers in the semi-intensive production rely on rotational grazing (Table 21)

Table 21: The percentage of types of grazing used in the production systems

<b>Type of grazing</b>	<b>All %</b>	<b>Semi-intensive %</b>	<b>Extensive %</b>
Traditional grazing	82	81	83
Rotational grazing	18	19	17
total	100	100	100

#### **4.2.3.4.5. The pasture ownership**

In the current study half of the farmers said that they are grazing in common land, about 20% of farmers at the extensive production system are grazing animals in public lands, 20 % of farmers in the semi-intensive system are grazing animals in rented land (Table 22). Only 15% of the lands which are used for grazing are owned by family.

Table 22: The percentage of ownership pasture in production system

<b>Ownership</b>	<b>All %</b>	<b>Semi-intensive PS%</b>	<b>Extensive PS%</b>
For family	15	14	16
Common land	50	50	50
Public lands	18	16	20
Rented land	17	20	14
Total	100	100	100

#### 4.2.3.4.6. Movement freedom and herding process

In the current study, farmers said that the flock of sheep and goats is moved from the east part to west part of the same area or from the village to hamlet. Nearly 89% of farmers are moved from one place to another (Figure 10). Only 11% of farmers are not moved and found all the year in the same area

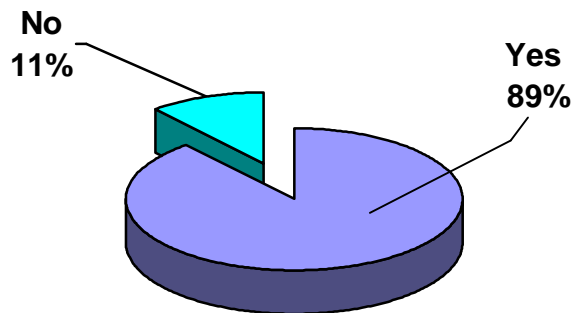


Figure 10: The folk of sheep and goats movement in the study area

If the flock of sheep and goats are moved, about 31% of flock is moved with all family members, 42% of flock is moved with mother and father from the family (Figure 11) 9% of flock is moved with some of the family members and 18% of flock is moved with the farm owners only.

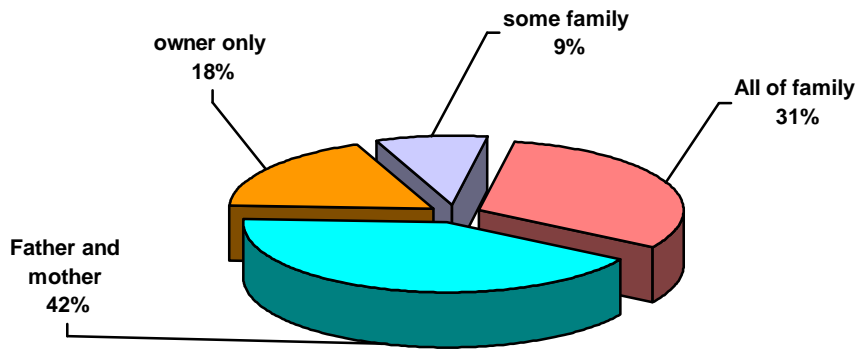


Figure 11: Family members move with the flock of sheep and goats at study area

The data shows that about 45% of flock grazing is done by the farm owner with the help of his family, 18% of flock grazing is done by the farm owner with some family members, 24% of flock grazing is done by the farm owner alone (Figure 12). Five% of the flock is grazing by the farm owner with groups, and only 8% of flock grazing is done by shepherd.

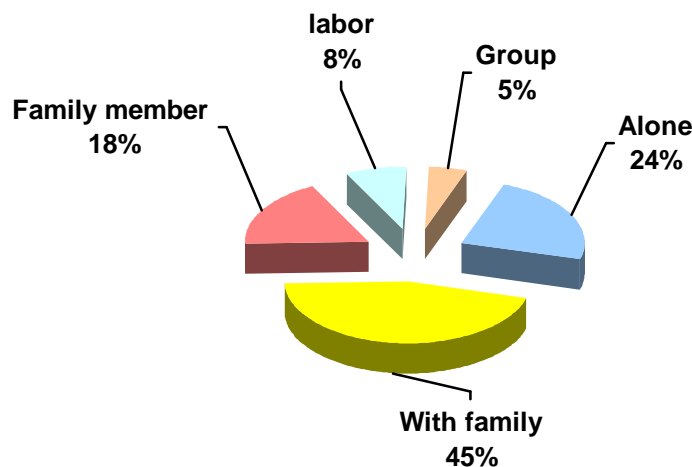


Figure 12: The herding of sheep and goats at the study area

#### 4.2.3.4.7. The grazing restrictions

Seventeen percent of farmers, 22% of them from the semi-intensive production system, said that they can graze and move freely without any restrictions, while 83% of farmers said that they suffer from restrictions at



grazing animals (Table 23), about 88% in the extensive production and 78% in the semi-intensive production system.

Table 23: The percentage of farmers who found restrictions for grazing

Answers	All farmers	Extensive	Semi-intensive
Yes %	83	88	78
No %	17	12	22

As for the cause of these restrictions; 22% environment, 25% socially, 14% economical, 15% separating wall, 11% Israeli settlement and 13% security reasons (Figure 13).

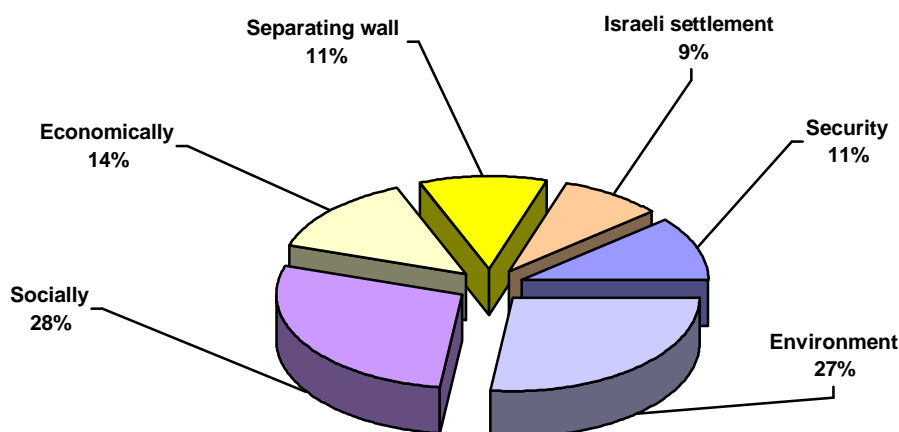


Figure 13: kinds of restrictions in the study area.

#### 4.2.3.5. Land ownership/tenure status

Land tenure refers to a set of rights which a person or organization holds in order to own, have access to or use land. Security of land tenure is not limited to private ownership, but can exist in a variety of forms such as leases of public land or user rights to communal property. Data show the high percentage of land tenure in the three production systems is inherited, where about 69%, 68%, 64% of land in intensive, semi-intensive and extensive production system respectively, 19% of land in extensive system are communal land, 8% of land in semi-intensive are leased land, but 29% of land in intensive production are purchased (Table 24). The cost of land is different

from place to another and even in the same place, the high cost of land is found in the intensive production system, especially if land is purchased not inherited or leased. For example, the cost of 1000m<sup>2</sup> in Halhoul and Beit-Ummar may be reach about 30,000JD.

Table 24: Percentage land ownership/tenure status in production systems

Land	Intensive %	Semi-intensive %	Extensive%
Purchased	29	24	11
Inherited	69	68	64
Leased land	2	8	6
Communal land	2	0	19
Total	100	100	100

#### 4.2.3.6. Feeder and drinker design and materials

This study shows that 100% of troughs feeders which are used in farm sheep and goats are iron feeders and the price ranges 20 to 30 JD according to the market prices. The automatic drinkers are found only in the intensive system which cost about 30 JD in price (Table 25), about 42% of farmers in the extensive system used cement drinker, each drinker costs 10 JD. 61% of farmers in the semi-intensive system used plastic drinkers, and 25% of farmers in the extensive system used iron drinkers, the iron and plastic drinker are home residues and cheap cost (Table 25)

Table 25: The percentage and cost of feeder and drinker in sheep and goats

Items	Intensive %	% Semi-intensive	Extensive%	Cost JD
drinker material				
Automatic	25	0	0	30
Cement	36	25	42	10
Plastic	39	61	33	----
Iron	0	14	25	----
Total	100	100	100	

#### 4.2.3.7. Source of water

The data shows that about 30% of farmers depend on cisterns and/ or mobile tanks in watering their herds. Only 25% of farmers depend on precipitation in

watering their herds, 45% of them depend on water networks in watering their herds. The annual average of water consumption per head is 3 cubic meters and the average price is 2.9 JD as purchased from the municipal but if it purchased from tanks it is 10 JD. Therefore, the annual average cost per head is 8.7 to 30 JD (figure 14)

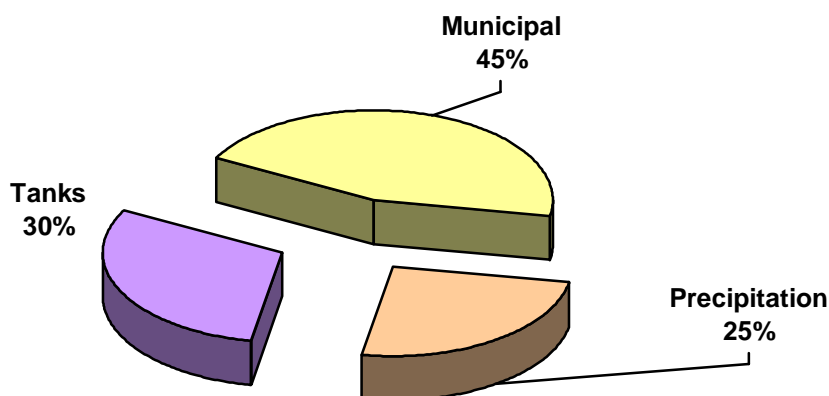


Figure 14: Source of water in study area.

### 4.3. Herd Structure

The statistical analysis shows that the average of herd size is 39 head in the intensive production system, while the average of herd size is 45 heads in the semi-intensive production system. On the other hand, the average size of herd in the extensive production system is 118 heads only. In addition, it shows that the highest maximum numbers of sheep and goats found in the intensive system where the maximum numbers reach 800 heads in the farm but in the semi-intensive production systems are 331 heads and 278 heads in the extensive production

#### 4.3.1. Sheep and goats breeds

The current study shows that the most farmers of the area are interested in local breeds of sheep and goats. This may refer their resistance and adaptation to environmental conditions and because people usually resist change. About 61% of the farmers rearing sheep and goats are said not included one breed of

sheep or goat but included with different breed; Awassi sheep, local goats, Shami goats, until Assaf sheep (Table 26). In addition, 25% of farmers are rearing local goats in the extensive production, 53% of farmers in the intensive production are rearing Assaf sheep, and only 3% of farmers in the semi-intensive production are rearing Shami goats. The table below shows that the highest percentage of Assaf and Shami was found in the intensive production, while the highest percentage of local goats and Awassi was found in the extensive production system.

Table 26: The percentage breeds of sheep and goats in three production systems

<b>Breed</b>	<b>Intensive %</b>	<b>Semi-intensive %</b>	<b>Extensive %</b>
Different breed	38	50	61
Awassi sheep	0	5	6
local goats	7	10	25
Assaf sheep	53	32	8
Shami goats	2	3	0
Total	100	100	100

#### **4.3.2. Reproduction and production of sheep and goats**

The reproduction cycle of sheep and goats starts in June / August. This period is called the mating season and five-months of gestation. Lambing or kidding starts in December /January. The lambing, kidding, and weaning percentages is affected by environment; and so lambing and kidding unassisted are some of the most important factors influencing profits in the sheep and goat business. The owners of sheep and goats in the study area said that the mortality rate and disease infection for lambs and kids born in warmer period higher than in cold period. All of male kids or lambs are for sale but female remain in farms. Owners of farm in the study area said that during the breeding season for the sheep and goats they provide feed supplement, which aims to improve the breeding season, in addition to give the animals' vitamins and minerals needed to increase production and this in turn increases the cost of production.

#### 4.3.2.1. Meat productions

The results show, about 89% of farmers said that their ewes and goats give one lamb or kid annually. The rest of farmers, which represents 11%, most of them from the intensive production system, said that their herds give three lambing every two years. 59% of lambs and kids are rearing after birth until weaning then sale, 19% of lambs and kids are the sale at six month in market, around 22% of lambs and kids are maintain to fattening for events ,home and Eid al-Adha.

#### 4.3.2.2. Mortality rate

The current study shows that mortality rate among newborn lambs and kids is less than 6.2% in the intensive production, 9.5% of lambs and kids are mortal in the semi-intensive, the high rate of mortality is found in the extensive system, it is about 12%.

#### 4.3.2.3. Milk and milk productions

In the current study, the milk is processed to several forms, that are; 5% of milk production is used as fresh milk, 6% of milk is used as yogurt, 8% of milk is used as butter, 11% of milk is used as Jerjab, 25% of milk is used as cheese, 28% of milk is used as jameed, and 17% of milk is used as Arabic margarine (Figure 15).

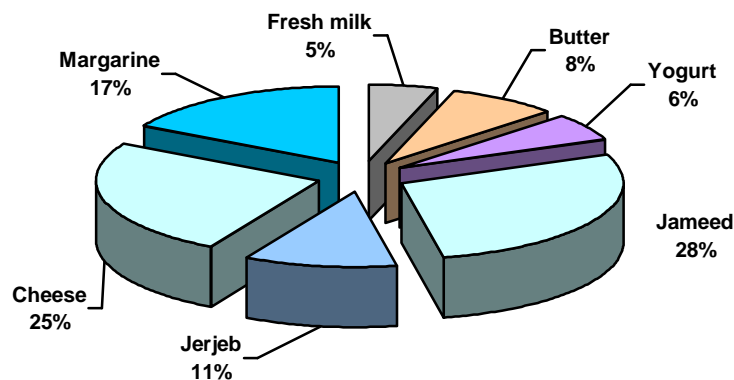


Figure 15: percentage of milk products sales by the sheep and goats farmers at study area.

#### 4.4. Market system

About 80 % of sheep and goats production is crude meats; as lambs, kids, or ewes and does excluded, where 74% of sheep and goats production is marketing in several canals but 6% is used at home. Milk and milk production represent 20%, about 14% of milk and milk production is marketing and little amount consumed in home represent 6% (Table 27).

Table 27: The percentage of outputs in sheep and goats used for sale and home

<b>Animal production</b>	<b>Use for sale %</b>	<b>Used for home %</b>	<b>Total %</b>
Crude meats	74	6	80
Milk and milk production	14	6	20
Total	88	12	100

##### 4.4.1. Place of marketing

Marketing of sheep and goats and their products has a long tradition in the study area (Table 28). The quantity of fresh milk sale is limited, and so processed with different forms for sale. Sheep and goats may be sold directly to a consumer in village, or sold to traders at sheep market. Most of yogurt (Makhed) 54% is marketing in traditional ways at village by wholesaler, middlemen or retailers, 36% is marketing in Hebron city at special shops, most of Jameed 54%, cheese 53% and Arabic margarine are marketing at Hebron city with special shops 83% of lambs and kids, 96% of excludes ewe and doe are marketing in alhalal market (Friday market) (Table 26).

Table 28: The percentage of the marketing canals for sheep and goats products

<b>Market location</b>	<b>Makhed yogurt %</b>	<b>Jameed %</b>	<b>Cheese %</b>	<b>Arabic margarine%</b>	<b>Lamb or kids %</b>	<b>Excludes %</b>
Home	10	10	5	3	4	1
Hebron city	36	54	53	70	5	0
Sheep market	0	40	10	11	83	96
Other	54	6	32	6	8	3
Total	100	100	100	100	100	100

#### 4.4.2. Price of marketing

The survey covers the relation of farmers with the production systems and general issues for marketing: feedstuffs, milk-products, and livestock. Detailed questions asked about the price of input (revenue) and outputs for the year 2008. The prices of sheep and goats products in the Palestinian market are not fixed, that varies from place to another and from time to time; due to the supply and demand on sheep and goats products, and not controlled by the government. The farmers said the price of crude meat is 5.5 JD /Kg meat crude, the price of fresh milk is one JD/Kg , the price of Margarine (Ghee) and butter are the same five JD for kilograms , and the price of Jammed is ten JD/Kg, and the price of Jerjeb is 4JD /Kg (Table 29).

Table 29: The prices of sheep and goats products according to farmers

Article sold	Crude meat	Milk	Makhed Yogurt	Jerjeb	Margarine (Ghee)	Jammed	Butter
(JD)/KG	5.5	1	1	4	5	10	5

Source: fields 2008

#### 4.5. The profitability of sheep and goats at the three production systems

The profits of sheep and goats in the three production systems were calculated by using the budgetary analysis method. The budgetary analysis based on the cost of inputs and returns of sheep and goats in farms. The price of inputs and outputs are based on the market prices for the current year 2008 as indicated by the interviewees. There are two types of costs associated with farm's production; variable cost (operating) and fixed cost.

The detailed result of budgetary analysis for sheep and goats enterprise in the study area is found in appendix 1, 2, and 3.

Our study shows that the total return of extensive production system in all the study areas is 202.40 JD/ head, while in semi-intensive production system is 242.00 JD but in the intensive production system is 308.20 JD. Also our study

shows that the high total cost is presented in the intensive production system 265JD/ head, then in semi-intensive production system 194.4JD/head and last in extensive production system 146.5JD/head. The results also show that profits for one head of sheep and goats are 55.9 JD in the extensive production system, 47.6 JD in semi-intensive production system and 43.2 JD in intensive production system (Table 30).

Table 30: Fixed and variable costs, return, profits, in three production systems.

<b>Item</b>	<b>Extensive JD/ head</b>	<b>Semi _intensive. JD/head</b>	<b>Intensive JD/head</b>
Fixed costs	10.6	20.1	30.6
Variable cost	135.9	174.3	234.4
Total cost	146.5	194.4	265
Return	202.4	242.0	308.2
Profit /heads	55.9	47.6	43.2

Source: researcher, and the study

#### **4.5.1. Profitability of sheep and goats at the intensive production system**

The results of the budgetary analysis for sheep and goats in the intensive production system at north and north-east of Hebron district (study area) at 2008 are presented in (Table 31). It shows that the highest profitability is found in Beit-Ummar then Sa'ir where the profitability is 51.75 JD/head, 46.27 JD /head respectively in this areas , so this type of production is suitable for these areas, in Bani-Na'im and Halhoul also found profitability but less than in Beit-Ummar and Sa'ir.

Table 31: Profitability of the intensive production system in study area.

Items	<b>All N (55)</b>	<b>BN N (26)</b>	<b>HL N (12)</b>	<b>SR N (7)</b>	<b>BT N (10)</b>
Fixed cost	30.6	37.5	69.9	56.3	20.6
Variable cost	234.4	269.6	287.9	278.6	200.1
<b>Total cost</b>	<b>265</b>	<b>307.1</b>	<b>357.8</b>	<b>334.9</b>	<b>220.7</b>
<b>Return</b>	<b>308.2</b>	<b>346.2</b>	<b>390.7</b>	<b>381.7</b>	<b>271.8</b>
<b>Profit/ head</b>	<b>43.2</b>	<b>39.1</b>	<b>32.9</b>	<b>46.8</b>	<b>51.1</b>

See details in Appendix 1.



#### 4.5.2. Profitability of sheep and goats at semi-intensive production system

The semi-intensive production system of the sheep and goats is one of the most important systems used in the north and north-east of Hebron, because animals used natural resources as grazing, in addition to the use of industrial resources. This system is intermediate between the intensive and extensive production systems. The data shows that the highest profitability is present in Bani-Na'im then Sa'ir where the profit is 70.3JD/ head, 57.0 JD/ head respectively. This type of production is suitable for these regions, in Halhoul and Beit-Ummar also it was profitable but less than in Bani-Na'im and Sa'ir (Table 32).

Table 32: Profitability of the semi-intensive production system in the study area.

Items	All N (57)	BN N (14)	HL N (16)	SR N (12)	BT N (15)
Fixed cost	20.1	20.1	35.0	19.9.1	23.7
Variable cost	174.3	199.3	184.3	154.3	190.4
<b>Total cost</b>	<b>194.4</b>	<b>219.4</b>	<b>219.3</b>	<b>174.2</b>	<b>214.1</b>
<b>Return</b>	<b>242.0</b>	<b>289.7</b>	<b>245.7</b>	<b>231.2</b>	<b>235.3</b>
<b>Profit/ head</b>	<b>47.6</b>	<b>70.3</b>	<b>26.4</b>	<b>57.0</b>	<b>21.2</b>

See details in Appendix 2.

#### 4.5.3. Profitability of sheep and goats at the extensive production system

The extensive production system of sheep and goats is considered as one of the most important production systems which are used in the study area, especially in Bani-Na'im and Halhoul, because they provide the appropriate conditions for sheep and goats. The results shows that the highest profitability of animals is found in Halhoul then Bani-Na'im where the profit is 69.98 JD / head, 58.52 JD/ head respectively in this areas. This type of production system is suitable for these regions, in Sa'ir and Beit-Ummar (Table 33).

Table 33: Profitability of the extensive production system in the study area.

Items	All N (38)	BN N (20)	HL N (5)	SR N (6)	BT N (7)
Fixed cost	10.6	8.7	18.9	20.5	7.8
Variable cost	135.9	138.4	146.1	142.9	94.1
<b>Total cost</b>	<b>146.5</b>	<b>147.1</b>	<b>164.9</b>	<b>163.4</b>	<b>101.9</b>
<b>Return</b>	<b>202.4</b>	<b>205.9</b>	<b>231.6</b>	<b>217.3</b>	<b>134.7</b>
<b>Profit/ head</b>	<b>55.9</b>	<b>58.8</b>	<b>66.7</b>	<b>53.9</b>	<b>32.8</b>

See details in Appendix 3.

## **5. Discussion**

### **5.1. Distribution of sheep and goats owners in study area**

The analysis shows that the highest number of farmers was in Bani-Na'im and then Halhul and Beit-Ummar and the last in Sa'ir (Table 9). Also the data analysis shows that the highest percentage of extensive production system was in Bani-Na'im, followed by Beit-Ummar and Sa'ir and a little in Halhul. These areas have available natural grasslands and rangeland such as masafer Bani-Na'im and Safa in Beit-Ummar. The results also show that the highest proportion of semi-intensive production system in Halhul and Beit-Ummar where adopted during the summer season, the remains of plants and crops as well as the remains of vegetables and grapes .Finally, the intensive production system was in Bani-Na'im, Bani-Na'im is suitable for the three production systems for sheep and goats.

### **5.2 Socio-economic factor:**

#### **5.2.1. Human resource**

##### **5.2.1.1. Family size**

The average of family size for sheep and goats owners in the study area is 10.20 members as shown (Table 10). This is the typical family size in rural area in Palestine. This is considered high average of family size comparing with the average of family size of the agriculture holder in Palestine which is 8 family members (PCBS 2005). This family size is related to culture and traditional aspect. In Al-Jabari (2010) and Al-Qouqa (2006) found that the average family size was 12.39 and 11.3 family member in the same area of Hebron. These results are nearly similar to our results. The ratio of males to females is 51%:49% this result is similar to PCBS (2009), it shows that the ratio of male to female is 103:100 .In other words, the number of males is higher than female in Palestine , not only in the study area (table 13).

### **5.2.1.2. Family member's classification**

The data in (Figure 6) shows that the proportion of individuals from children is 38%, the highest proportion compared with the students, workers, individuals married as well as in universities. This ratio is nearly similar to the result of the PCBS for the year 2007 where the percentage of children under 14 years in the West Bank was 41.9%, while the percentage of students was 29%, the percentage of workers was 15%, the proportion of married couples was 11%, and the lowest proportion of university graduates was 7%. As can be seen from the results the production of sheep and goats is not suitable to the graduates, but workers are considered to raising sheep and goats is secondary function for income and money, the students and children is the highest percentage in their families to help only.

### **5.2.1.3. The gender of farm owner**

The proportions of male's owners represent 81% in all production systems (Table 11). In general the high percentage of male farmers may be due to their access to farmland and their position as head of family. The highest male owners were in semi-intensive system, then extensive and finally intensive, but the highest found female ownership was in intensive system, then the extensive systems, and finally in semi-intensive. This indicates that males want to production sheep and goats outside the farm, while females interested in nutrition because most Condensed sheep could hardly go out to pasture as the addition to raising sheep is the work of female secondary after a home business. The result was similar to the finding Verbeek, et al,(2007) they show that male represent 88% of owners but females only 12%. And nearly similar to the rate in Palestine according to the census population for the year 2009, the proportion of males was 90.1% (PCBS 2009). Therefore, it is noticeable that males have a larger role in the production systems for sheep and goats and has the majority in the farm of farms, added most businesses of farm animals associated with male.

#### **5.2.1.4. Age of the farm owner:**

Gordan and Craig, (2001) say that age is a dimension of human capital; younger members have higher capacity for activities income earning opportunities. In (Table 12) the age groups between 30 to 69 years are the most prevalent 81 % in all three production systems of sheep and goats. But concentrated in intensive production, and then in extensive, and semi-intensive production systems. Also observed that 29< is the least found; due to the people that are interested in studying about goats and not interested in studying it makes their income less wanted. And the group of 70> high represent in extensive production systems given to the grandchildren from their great grandfathers. This nearly similar to the result of Verbeek, et al. (2007) they found that 81% presented between 31-70 years, and also similar to Hadjigeorgiou ., et al .(1998) found that 80% presented between 30-64 years . Al-jabari (2010) found that 72% of farm owners presented between 30-59 years. Most of the <29 years age group moving for Israel work or other sites that have highest financial return than sheep and goats production.

#### **5.2.1.5. Experience of the farm**

Experience are of the most important things to be perfect when the sheep and goat, knowledge and ability to labor and good health are important human capital (Gordon and Craig, 2001) and determine available labor for both farm and off farm activities. (Table 13) show that the experience of farmers are divided into four groups, the highest group of farm presented in 10-24 years of experience and highest in the intensive production system, and second group presented in 25-49 years of experience and highest in the extensive production, but other groups represented with low proportions. This indicates in the current time the production is oriented to intensive production system.

#### **5.2.1.6. Main profession of owner**

The production of sheep and goats are important project of economic and profitable for a large number of the community members, it is a key source of income for individuals, especially farmers, or as a secondary source of income when other segments of society workers and housewives as well as employee and students. In the study area it is clear that the sheep and goats owners depend on farm and on production of sheep and goats as a main profession; because the condition of the area is suitable for rearing sheep and goats, and the source of livelihood after the close down to work in Israel, or limited work in West Bank (Table 14) the data revealed that 40% main profession are farmer, then 30% are worker. But Al-jabari (2010) found that high percentage of farm main profession that 58.2%. The high portion of profession is farmer; due to the sheep and goats require people who have the ability to stay with the animals as long as possible full-time to care for animals. Note also of the study that 30% of the keepers of sheep and goats are workers (in Israel) and considered that breeding sheep a secondary source of income to them because of the difficult economic conditions, and there is 18% of the keepers of sheep and goats are women and housewives.

#### **5.2.1.7. The educational level of farmers**

Most farmers in the study have low or no level of education (72% under secondary level) for this reason they deal with rearing sheep and goats (Table 15). While the proportion of those in high school 21%, and in university degree holders were accounted for only 7%. The highest proportion of illiterates is in extensive production system. The result show that 45% of owners have elementary (can read and write). While in AL-jabari (2010) found that is 32.9% having elementary education but in Dudeen 2009 found that 51% of the owners have no or only elementary.

## **5.2.2. Management of Sheep and goats**

### **5.2.2.1. Labor distribution gender at three production systems.**

It is notice in the study that women's is involved in the production of sheep and goats at about 45% of all routines business daily in the breeding of sheep and goats while the male is the highest percentage 55% (Figure 7). Which is a right for the entire male and the woman has a special role in the production of sheep and goats

### **5.2.2.2. Responsibilities & division of labor gender**

Both male and female do a large number of tasks related to animal production, with some degree of variation in involvement from region to region. Patterns of gender division of labor are location-specific and change over time. Although the most typical pattern of gender division of labor is that female are responsible for animals kept at the homestead, female generally contribute more labor inputs in areas of feeding, cleaning of barns, milking, butter and cheese making and sale of milk and its products than male. Through the study notice that the percentage of females are stationed in the process of milking and milk processing 100% , while stationed in the male role of grazing 98% as well as give treatments 95% (figure 8). This agrees with some studies. A study of the participation of men and women in feeding and milking livestock in male and female headed households in Bangladesh shows that women participate more in all activities in both households types (Paris 1992). The preparation of milk products recorded the highest share (100%) of women's labor input in dairying as a percentage of total labor, and feeding of animals (25%) in Karnal District (Dhaka et al. 1993).

### **5.2.3. Economical factor**

#### **5.2.3.1. Types of bran in sheep and goats at three production systems**

There are many different types of bran that can be used for sheep and goats. Semi-open barns, unroofed barns, cave and enclosed barns buildings are usually the most expensive, but they provide the best protection for the shepherd, sheep, feed, and equipment. Our study show that about 93% of enclosed barns in intensive PS and semi-intensive PS (Table 16), the present highest percentage of the enclosed barns leads to increases the cost of farm inputs, because it included in the construction of barns cement and iron as ultimately leading to the increased cost of production inputs intensive and in the semi-intensive, but when semi-open barns used , as well as unroofed barns that are a less expensive its more prevalent in traditional and semi-intensive production system, this reduces the cost of inputs in these systems. The least expensive is to use the caves as to houses for an animal in the extensive production makes cost very cheaper. This is in line with Kilgour et al. (2008), shows that the cost of resource of construction in traditional and semi-intensive production less than intensive production, so the traditional production is less expensive than barns building.

#### **5.2.3.2. The feed resource of sheep and goats at three production systems**

Our study shows that the cost of feeding constitutes 65-70% of capital for sheep and goats in general. Also most feed for sheep and goats provided from market and only 25% of feed provided from other sources as residues of crops and land planted and other. If the rainfall is good the quantity of feed from the market reduced in that year, depending on the quality of native vegetation pasture. But when contribution of natural pasture reduces the use of feed grain and other concentrates feed increase. Dudeen (2009) found that farmers depend 100% on buying fodder from market, but Al-Jabari (2010) found 87% of fodder was in market.



### **5.2.3.3. The concentrated feed in sheep and goats (cereal).**

Concentration feed as grain and protein source is often fed to sheep and goats with higher nutritional needs, such as pregnant ewes during late gestation, ewes nursing two or more lambs, and lambs with the genetic potential for rapid growth. Grain is the seed part of cereal crops such as corn, barley, wheat, and oats. A protein source such as soybean meal or cottonseed meal is usually added to the grain ration, along with vitamins and minerals to make a 100 percent nutritionally-balanced feed. Unbalanced grain rations can lead to a variety of health concerns.

And concentrate fodders always raise the cost of production inputs; our study show that concentrate feed are used in high rates in intensive 26% and semi-intensive 20% and finally extensive production only 14% as supplement feed in extensive. The use of concentrate feed in intensive production systems is due to the rearing intensive animal. This is lead to raise the costs of intensive production system.

In this study the majority of sheep and goats owners depend on two kind of concentrate feed barley grain and wheat bran. Some time depend straw of barely or wheat, wheat grain (Table 17), because of their cheap price , this similar in Al-Jabari (2010) in Palestine and Rolf Wachholtze (1996) in Syria , shows that the most important hand feed-stuff, were barely grain and straw and wheat bran. Also in Jordan market feed from private sources had a considerably higher share, with barely, barely-sorghum mixture and bran, cereals are the main fodder (Maurer 1999).

#### **5.2.3.4. The forage feed in sheep and goats (Roughage)**

##### **5.2.3.4.1. Reliance on grazing as a source of sheep and goats feed**

It notes in (Table 18) that the rangeland that doesn't cover high percentage needs of sheep and goats according to what farmers say is the decreasing amount of rainfall effects on increasing the income of extensive and semi-intensive production and so we depend on rangeland not for buying feed from the market.

##### **5.2.3.4.2. Grazing area**

The result shows that 24% of farmers are grazing around their residence in village while 58% of farmers in the extensive production system are moving within the area or in mountains (Table 19). These lead to decrease the vegetation of rangeland or desertification.

##### **5.2.3.4.3. Grazing Season.**

Pattern will vary from year to year according to weather and price conditions. Diet changes occur from year to year with difference in weather. Wet years shift the proportion towards native vegetation and dry years towards hand-fed feed-stuffs and crop, our study shows that the rangeland is low value in total vegetation cover.

##### **5.2.3.4.4. Time and the grazing Method**

Our study shows that the time for grazing is 7 to 9 hour in both extensive and semi-intensive production system and the most grazing system use was tradition method (Table 20 and Table 21).

Blanchet et al, 2003 say that grazing systems range from continuous grazing of one area over a long period of time to intense rotational grazing on small areas for short periods of time. Livestock systems that use continuous grazing of a pasture experience both overgrazing and under grazing of forages. A rotational system provides a rest opportunity for forage plants so that they may

regrow more quickly. Our study show the type of grazing system used in the study area is Traditional grazing with high percentage 82% in both extensive and semi-intensive production (Table 21). Only 18% of farmer used rotational grazing systems. Through the study show that the deterioration of vegetation and desertification due to overgrazing in the study area as well as many of the owner of animals show that the raising sheep and goats is not to profitable. This similar with Lemus 2008 Continuous grazing usually leads to the overgrazing of specific areas due livestock selectivity and causing issues with fertility and weed control.

#### **5.2.3.4.5. Ownership of pasture land:-**

In the study area, lands for grazing are classified into four types, for family, common, land for none, and land rented. Most of land is common land 50% in both extensive and semi-intensive production system (Table 22). This leads to reduce cost of input of this production system.

#### **5.2.3.4.6. Responsible grazing process.**

A grazing is important processes in the production of sheep and goats; they provided food for sheep and goats, in addition to reducing the cost of production inputs, as well as the involvement of family members in the pasture. It is show that 45% of the farm owners are together with your family when grazing sheep and goats, 24% of the owners of animals that grazing of sheep and goats alone, some owner of sheep and goats grazing at groups, or rentals shepherd to the grazing (Figure 11).

#### **5.2.3.4.7. Movement freedom and herding process.**

Our study show that 89% of herder sheep and goats moving from one place to another in the villages or other cities applied for the good pastures and the provision of water. These herder moving with, mother and father 42%, or all family 31%, or owner only 18%, or some family 9 % ( Figure 13). So the movement of farm

#### **5.2.3.4.8. The grazing constrains**

There are many factors that grazing constrains in Palestine generally and the study area in particular, the most factor that grazing constrains are: environment factors represent 27% in study there are more limitations to the breeders of sheep and goats; due to decrease of rainfall and then to reduce the grasses and vegetation, overgrazing and desertification, social factors represent 28% considering with regard to ownership of lands and not to allow grazing in some areas grazing. Israeli occupation (settlements and separating Wall) represent 20%, and the other factor economical and security factors (Figure 13). These constrains on grazing affected and feeding cost in extensive and semi-intensive production systems to lead increase input, the same constrains mentioned present in (Janazreh 2007 and Al-Jabari 2010).

#### **5.2.3.5. Land ownership/tenure status**

Ownership of land is sometimes referred to as a “inherited, purchased, leased, or communal land”. Different rights in a single piece of land may be held by different users: for example in a “communal” land tenure system, government may claim the ultimate ownership of land and the right to decide on its use, but in practice land is allocated by a traditional authority such as a chief, to a farmer who can then use it for crop production, and who may or may not have the right to pass it on in inheritance. This land high present used in extensive PS compare with intensive and semi-intensive. Inherited lands are high present in three production system about 67%. Purchased that high present in intensive and semi-intensive; lead to increase output of production, (Table 24). Leased land is need in sometime in semi-intensive and extensive production systems to cultivate and it use as pasture, when the lack of natural pastures.

#### **5.2.3.6. Feeder and drinker design and materials**

When building a house of sheep and goats, there are a number of factors to consider: efficiency, economy, the size and mix of your enterprise, the

existing facilities, and the type and number of sheep and goats you want to run. These factors are all important in the planning for housing of animals.

Construction material used in production systems are stone, cement, bricks, cave. Use of cement 55% , brick 23% , and stone14% in the intensive and semi-intensive production is lead to increase input cost while the use of these substances at rates lower rate in extensive production as well as the use of caves 22% is lead to reduce cost inputs and increase profits of production (Table 25). So sheep and goat built housing should meet animal requirements and serve a producer's needs at the lowest possible cost.

Feeding supply is specific to each species of animals. They should be adapted to the height of the animals so that they can satisfy the vital needs of food. Regarding working conditions the means should also meet the requirements of the person who takes care of the herd, and, finally, they should meet the requirements of the economic situation of the farm. Equipment of feed may be quite different according to the production system. Intensive systems generally are high in investment expenses; extensive systems are generally lower (Bartali, 1999). Our study show that 100% of feeder trough made of iron in study area. But size and cost different from production the high cost found in intensive production this similar in Bartali 1999.

The required size of a water trough depends on whether the trough is intended to provide storage in addition to being a drinking vessel, on the total number of livestock being served, on the rate at which the trough can be filled, and on how many animals the trough is intended to serve at any given time. And should include the storage volume necessary for carry-over between periods of replenishment. The trough or tank, when installed, should be a height compatible to the size of livestock using the structure. A trough or tank should be made of materials that can be expected to remain functional for a number of years. The watering should be done in metallic troughs or cement channels. our study show that high percentage of automatic watering found in intensive

PS 25%, the highest percentage of plastic watering is found in semi-intensive , but cement and iron is present in extensive, so the high automatic watering found in intensive PS leads to increase cost of input( Table 25).

#### **5.2.3.7. Water source**

The sheep should be watered at least once a day at the rate of 2-3 liters per head per day. The requirement of water for sheep and goats during summer month will be slightly more and may range between 5-6 liters. The younger ones may require 1-2 liters of water every day. Water is essential. Without an adequate supply of quality water, animal health, weight gain, or milk production can be negatively affected. Source of water from rainfall, buy, or municipal; in study most of water source in, buy 30% or from municipal 45% or rainfall 25% (Figure 14). The buy water from tank owner may be to high input because 1m<sup>3</sup> price 10 JD in other hand when municipal 1 m<sup>3</sup> price 1JD.

### **5.3. Herd structure**

The average flock size for sheep and goats in the study area is high and the number of sheep and goats is increased at intensive production compare at semi-intensive and extensive production system. In study the means of sheep and goats numbers are 123 heads in intensive PS, 50 heads in semi-intensive PS, and 39 heads in extensive PS. This result is similar to Dudeen (2009) and Al-Jabari (2010) .Total number of sheep and goats in the study area is 41,300heads and total number of sheep and goats is 252,212 Hebron (MOA, 2008). The number of sheep and goats varies from year to year and from place to place, and this for several reasons: The most important is weather conditions and lack of rainfall, go to Israel to work and leave the production of sheep and goats, As the production of sheep and goats was not economically viable, the direction of the new generation to industrial developments and limit production of sheep and goats for the elderly, as well as higher prices of production inputs.

### **5.3.1. Sheep and goats breeds**

There are many sheep and goats bred in Palestine as Awassi and Assaf, as well as black and Shami goats. The animals adapted to the circumstances surrounding environment to arid and semi-arid area. This result is similar to Dudeen (2009 ) and to Al-Jabari (2010). Shows that most types of sheep and goats in the study area is different breed of sheep and goats is found 50%, While Assaf sheep found at high rate for intensive and semi-intensive PS are found 88% in study; because needs of special care such as nutrition and not go out to pasture, and it high-output, the Awassi sheep and black goats are found in extensive PS; because tolerance environment conditions and pasture (Table 26).

### **5.3.2. Reproduction and production of sheep and goats**

The sheep and goats have a multi-purpose product: the primary products such as meats, milk and milk-product, and the secondary products such as manure, wool and hair.

Reproductive efficiency is one of the most important factors affecting profitability in sheep and goat enterprises, though optimal reproductive level varies by production environment and resource availability. Reproduction defined is giving birth to offspring and the survival of a species largely depends on its ability to reproduce its own kind, reproduction is a series of events (gamete production, fertilization, gestation, reproductive behavior, lambing/kidding, etc.) that terminates when a young animals is born. In study was a high degree of interest on the offspring (birth of animals) as well as the production of milk to know the profitability in the three types of production systems. Sheep and goats in study area is generally productivity of is very low. Reproductive performance is generally low with annual lambing and kidding rates of 1 for ewes Awassi, 1.6-2 for ewe Assaf and 1 for does (black goats), 2-3 for does (Shami). it show that the number of births in intensive PS more

than extensive and semi-intensive due to the type of sheep and goats are found in the production system and that affect to number of offspring.

In Palestine the main production of sheep and goats is meat and milk. Fertility is the percentage of breeding females that give birth per flock. Our study shows that mortality rang between 6% -13% according to production systems, this rate is high the reason similar in UAWC.

The percentage of fertility is less than 80%, because the feeding of sheep and goats less than their needs. Also the percentage of mortality for lambs born is high (20%), (UAWC).

#### **5.3.2.1. Meat products:**

Meat sheep and goats producers sell either slaughter lambs or feeder lambs. Slaughter lambs are usually purchased for immediate slaughter after weaning. In Palestine, the average slaughter weight for a lamb processed in butchers is 60- 70 kg. Lambs sold into Friday market (market sheep and goats) tend to be much lighter, usually less than 37-45 kg. PCBS 2008 Shows that the rate of production of sheep and goats meat were 7,400 ton the price was 44,634 \$ per in other word the rate of price kg of crude meat is approximately 6 \$ (4.3 JD). Which is less the price takes from the owners of sheep and goats in study area was said the rate of one kg of crude meat is 5.5 JD.

#### **.5.3.2.2. Milk and milk production:**

The main milk production in sheep and goats occurs between February and June. Sheep and goats milk is usually produced to several forms. Maybe is made into cheeses. Some milk is made into yogurt, other made into jammed or butter .Fresh sheep and goats milk are seldom to consume. Milk can be sold to a processor for conversion to cheese or the milk can be processed by the producer and marketed as a value-added product (Figure15).The same result found in Musa (2001) and Al-Jabari (2010). PCBS 2008 Shows that the rate of production of sheep and goats milk were 21.341 ton liters the price was 25.662



thousand \$ per in other word the rate of price liter of milk is approximately 1.2 \$ (0.85 JD). Which is the approximate the price from the owners of sheep and goats in study area was said the rate of one liter of fresh milk is one JD.

#### **5.4. Market location and condition.**

Marketing of sheep and goats is characterized by strong seasonality and subject to fluctuation. Demand and price increases during festival periods. Factors affecting market supply, as measured by the number offered, include high demand during religious festivals, lambing season, quality and quantity of grazing, as well as cash needs for crop inputs and, later, for food purchase before harvesting (EARO, 2000).

Marketing the products of sheep and goats is seasonally, for several reasons: The most important religious holidays, Muslim holidays (Eid al-Adha), as well as weddings (especially summer).

Sale and prices in sheep and goats products is related to quantities of rainfall, whenever the high abundant rainfall increased vegetative growth and increased grass pastures and fodder less purchased from market therefore increased sales of products, sheep and goats because the feed costs less, especially in extensive and semi-intensive production and this in turn increases profits from the farmers, on the one hand, the lower rainfall, led to an increase in product prices as well as increased inputs, especially feed due to lack of pasture, this in turn decrease profits from the farmers. For farmers in the study area said that the lack of attention to production of sheep and goat in generally and in extensive production especially is to the lack of pastures and lack of rainfall, as well as rising prices and urban sprawl to turn led to the degradation of agricultural areas and the lack of pasture all these things made the prices of meat products in high and volatile continuous especially at the present time, this result similar in Al-Jabari (2010).

Marketing in Palestine lacks drivers for most of that marketing of the products may be in the same village or the City of Hebron market to be sold.

### **5.5. Profitability of sheep and goats at three production systems.**

There are two types of costs associated with producing an agricultural product: variable costs and fixed costs. Variable costs vary according to the size of the enterprise, whereas fixed costs (overhead) occur regardless of the level of output. Examples of variable costs include feed, medicine, bedding, paid labor, buck replacement and supplies. Fixed costs include depreciation, insurance, repairs, taxes, interest, and land charge and can be difficult to allocate to among multiple enterprises on a farm (Schoenian, 2002). Our study shows that the variable (Operating) costs include feed, medicines, hiring, and replacement of supplies. The fixed costs include rent land, family worker, rent house, use tools (stripes and Mangers) and animals cost, all these cost affect the economic viability of the sheep and goat production systems.

Economic model building requires estimates of technical coefficients relating to mortality, fertility and parturition. Which include: - Milk and milk products (cheese, butter, margarine, Jameed, Jrajab, yogurt), in addition to the sale of meat; whether the lambs or animals are excluded. Added to the manure, wool or hair but there are not economically viable in the opinion of farmers through the study.

Return (revenue): includes products sold in the market such as selling animals to butchers, milk and milk products. Or products consumed by family members. through the study shows that an return of extensive PS is low 202.4 JD that link the quantity of feed, conditions of the environment, amount of rainfall that improve the properties of rangeland, in other hand the return in intensive PS is high 308.2 JD due to type and quantity of fodder, semi-intensive PS it intermediate to intensive and extensive due to quantity of fodder provide maybe from market or from pasture (Table 30).

Fixed or operating cost: They include land, buildings, tools (drinker, feeder), labor household, and animals, it show that the operational costs is higher in the intensive PS than the semi-intensive PS as well as extensive PS , because the intensive production depend on fodder from market, and feed represent 70% of the cost of the operation , so that increase operating cost in intensive production system is correlated with price of feed from market ,water, and labor rent , this cost is low in extensive and semi-intensive. Also the high fixed cost in intensive and semi-intensive production to use animals with high cost such as Assaf and Shami in intensive and semi-intensive but in extensive PS use animals with low cost , such as Awassi and black goats which is which adapt to the extensive production but low productivity (Table 30) .

Profitability: equals to total revenue minus total fixed and variable costs

$$\text{Profitability} = \sum \text{Revenue} - \sum (\text{fixed cost} + \text{variable cost})$$

In study show that despite the decrease in revenue in the extensive production system but the profit per head is highest value 55.9 JD and this is due to the low cost of fixed and variable, while the profit of per head in intensive production was less value 43.2 JD because of the high fixed cost and variable that associated with price of lands, building and type of animals as mentioned

### **5.3.3. Profitability of sheep and goats at intensive PS :-**

Our study shows that the highest profitability is presented in Beit-Ummar then Sa'ir. The profitability for head animal is 51.1 JD, 46.8 JD, this is due to highest revenue per head of animals and lowest cost of fixed and variable cost per heads, and so this type of production is suitable for these regions. In Bani-Na'im and Halhoul also found profitability but less than in Beit-Ummar and Sa'ir, due to high price of land and house construction in Halhoul.

### **5.5.2. Profitability of sheep and goats at semi-intensive PS:**

Semi-intensive production system of the sheep and goats is intermediate between the intensive and extensive production systems, when the budgetary

analysis for sheep and goats production system, it showed the following results the highest profitability is present in Bani-Na'im then in Sa'ir the profitability for head animal is 70.3JD, 57JD respectively, this type of production is suitable for these regions ,due to existence pasture, decrease cost of land and house construction . In Halhoul and Beit-Ummar to the whose present profitability is affected by the type of animals rearing, and high cost of land.

#### **5.3.4. Profitability of sheep and goats at extensive PS :-**

Extensive production system of the sheep and goats is the most important systems used , when there are the appropriate conditions such as pasture , type of animals with low cost. Our study has shown that the highest profitability is present in Halhoul then in Bani-Na'im; the profitability for head animal is 66.7 JD, 58.8 JD respectively. So we can say that this type of production is suitable for these regions. In Sa'ir and Beit-Ummar there also been found profitability but less than Halhoul and Bani-Na'im, due to reduce the pasture land Because of overgrazing, which has later resulted in desertification , urban sprawl , the use of grazing land for construction and the transfer of a large number of farmers from the extensive production systems to the intensive and semi-intensive.

## **6. Conclusion and recommendation**

### **6.1. Conclusion**

#### **6.1.1. Human Resources**

From this study, it can be deduced that the number of family members is high in the study area, and most of the family members' age was below 15 years. Consequently, this leads to decrease the level of family income. In addition people aged between rang 39-60 year old are the ones who rear sheep and goats, whereas, the younger members who are less than 29 years old don't care for rearing sheep and goats, as the regard it any benefit and don't fit their position.

It was noticed that most of sheep and goat's readers' major profession was either as farmers or worker in Israel who aren't education well or itinerates.

#### **7.1.2. Management Resources**

It has been shown throw the study that the management and rearing of sheep and goats depend mainly on both males and females in the most of the daily work, as the women is responsible for milking and milk processing to increase the quality of the production.

#### **7.1.3. Economical Resources**

From this study, it can be concluded that the type of barn, construction tools and equipment of farming do have an effect on the profit and loss, but the major factor for both loss or profit is feed which forms about 70% of whole cost. Therefore the present of pasture in extensive production system decrease the cost, where the use of concentrate feed at intensive and semi-intensive production increase the cost and decreases the benefit and returns.

#### **6.1.4. Herd structure**

The present study has shown that most of the sheep and goats which are bred in study area are Awassi sheep and Baladi (local) goats. And these breeds are low production but tolerant to environment. Therefore, it can be noticed that farmers tend to rear Assafi sheep and Shami goats as they are beneficial and increase the income due to high towing and high milk production.

#### **7.1.4. Market system**

It has been noticed that the market system in the study lack for distinguish selling center for sheep and goats production and most of the marketing is done by farmers themselves or by the wholesalers or retailers.

Milk and milk processing such as Jamed, butter, cheese, yogurt, are sold in the local market or made to cater for the family need, where as kids and lamb are sold religions or social occasions as wedding parties, or at Al-Adha Feast.

#### **7.1.5. Profitability for the production system in sheep and goats**

The study points out there are three type of production system of sheep and goats. These types are:

- Extensive or traditional production system which has low return but high profit per head of animals
- Intensive production systems with high return but the profit per head is low
- Semi-intensive production system which intermediate between intensive and extensive production system return and profit per head of animal

The three production systems are affected by fixed and variable cost.

## 6.2. Recommendation

The production systems of sheep and goats are very important and need to improvement through.

- Prevented overgrazing and desertification in pasture.
- improvement and rehabilitation rangeland
- Provide farmers with grains and forages with competitive prices to encourage them stay on rearing of sheep and goats.
- Job orientation sessions for breeders of sheep and goats to raise production efficiency specially in extensive production
- Establishing and expand number of extension centers, veterinary and agricultural production in the study area
- Increasing the research for getting efficient production systems of sheep and goats.
- Reestablishment of the cooperative societies to market the products of sheep and goats, and decrease the costs of production depending on the large economic of scale.
- Support the feeding cost.

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## Appendix

Appendix (1). Fixed and variable costs, return, profits, in the intensive production system

<b>Item</b> <b>intensive</b>	<b>all study</b>	<b>Bani-Na'im</b>	<b>Halhoul</b>	<b>Sa'ir</b>	<b>Beit-Ummar</b>	<b>%</b>
<b>Revenue</b>						
<b>Sale form</b>						
Animals	2198.5	2474.0	2823.0	2752.8	1929.2	72%
Total dairy production	381.1	428.8	489.3	477.2	334.4	12%
Excludes	121.2	130.5	105.1	109.9	120.0	3%
<b>Home consumed</b>						
Animals	234.5	263.9	301.1	293.6	205.8	8%
Total dairy production	146.6	164.9	188.2	183.5	128.6	5%
Manure	0.0	0.0	0.0	0.0	0.0	
Wool or other	0.0	0.0	0.0	0.0	0.0	
<b>Subtotal A</b>	<b>3081.8</b>	<b>3462.1</b>	<b>3906.8</b>	<b>3817.1</b>	<b>2718.0</b>	<b>100%</b>
<b>B. Operating cost</b>						
Total Cost of concentrate	1336.7	1559.4	1573.6	1565.3	1142.2	56%
Total Cost of roughage	361.3	421.5	425.3	438.3	308.7	15%
Total Cost of water	23.5	27.4	27.6	31.3	20.1	1%
Total cost of veterinary	72.3	84.3	85.1	85.6	61.7	3%
Total cost of rent labor	226.7	259.6	390.5	312.2	169.4	11%
Total cost of replacement	141.2	150.0	146.9	128.0	139.8	6%
Total cost of transportation	36.1	42.1	42.5	41.7	30.9	2%
Motility	146.6	152.0	188.2	183.5	128.6	6%
<b>Subtotal B</b>	<b>2344.4</b>	<b>2696.3</b>	<b>2879.7</b>	<b>2786.0</b>	<b>2001.3</b>	<b>100%</b>
<b>Fixed cost value</b>						
Total cost of rent land	180.5	213.1	386.6	315.6	116.6	56%
Total cost of rent farm	100.3	123.4	253.7	199.3	73.6	35%
Cost of drinker	15.0	21.3	33.8	28.2	9.2	5%
Cost of feeder	10.0	16.8	24.2	19.9	6.1	4%
<b>Subtotal C</b>	<b>305.8</b>	<b>374.5</b>	<b>698.2</b>	<b>563.0</b>	<b>205.6</b>	<b>100%</b>
<b>E.Total cost of enterprise B+C</b>	<b>2650.2</b>	<b>3070.9</b>	<b>3578.0</b>	<b>3349.0</b>	<b>2206.9</b>	
<b>Net enterprise profit A-E</b>	<b>431.7</b>	<b>391.3</b>	<b>328.8</b>	<b>468.0</b>	<b>511.1</b>	
<b>Number of animals</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	
<b>F. Profit per animal</b>	<b>43.2</b>	<b>39.1</b>	<b>32.9</b>	<b>46.8</b>	<b>51.1</b>	
<b>Revenue to cost</b>	<b>16%</b>	<b>13%</b>	<b>9%</b>	<b>14%</b>	<b>23%</b>	

Appendix (2). Fixed and variable costs, return, profits, in the semi-intensive production system

Item	all study	Bani-Na'im	Halhoul	Sa'ir	Beit-Ummar	%
<b>Semi-intensive</b>						
<b>Revenue</b>						
<b>Sale form</b>						
Animals	1720.3	2068.6	1727.2	1649.7	1664.5	71%
Total dairy production	298.2	358.6	299.4	285.9	288.5	12%
Excludes	126.5	139.1	154.3	111.9	133.3	5%
<b>Home consumed</b>						
Animals	114.7	137.9	115.1	110.0	111.0	5%
Total dairy production	160.6	193.1	161.2	154.0	155.4	7%
Manure	0.0	0.0	0.0	0.0	0.0	0
Wool or other	0.0	0.0	0.0	0.0	0.0	0
<b>Subtotal A</b>	2420.2	2897.3	2457.2	2311.5	2352.6	100%
<b>B. Operating cost</b>						
Total Cost of concentrate	980.0	1118.2	1003.8	822.6	1112.3	56%
Total Cost of roughage	213.6	243.7	198.1	147.6	199.6	11%
Total Cost of water	22.6	25.8	23.8	19.0	25.7	1%
Total cost of veterinary	37.7	43.0	39.6	42.2	42.8	2%
Total cost of rent labor	184.6	184.1	240.4	144.7	208.9	11%
Total cost of replacement	142.0	156.1	173.1	125.6	149.6	8%
Total cost of transportation	25.1	28.7	26.4	21.1	28.5	1%
Motility	137.6	193.1	138.2	220.0	136.7	9%
<b>Subtotal B</b>	1743.3	1992.7	1843.4	1542.7	1904.1	100%
<b>Fixed cost value</b>						
Total cost of rent land	100.9	111.0	215.5	102.6	113.7	54%
Total cost of rent farm	75.7	69.4	94.3	78.4	94.8	35%
Cost of drinker	13.5	11.8	22.9	10.3	16.1	6%
Cost of feeder	10.9	9.0	17.5	7.8	12.3	5%
<b>Subtotal C</b>	201.0	201.2	350.2	199.1	237.0	100%
<b>E.Total cost of enterprise B+C</b>	1944.2	2193.9	2193.6	1741.8	2141.0	
<b>Net enterprise profit A-E</b>	476.0	703.4	263.6	569.6	211.5	
<b>Number of animals</b>	10.0	10.0	10.0	10.0	10.0	
<b>F. Profit per animal</b>	47.6	70.3	26.4	57.0	21.2	
<b>Revenue to cost</b>	24%	32%	12%	33%	10%	



Appendix (3). Fixed and variable costs, return, profits, in the extensive production systems

<b>Item</b> <b>Extensive</b>	<b>All study</b>	<b>Bani-Na'im</b>	<b>Halhoul</b>	<b>Sa'ir</b>	<b>Beit -Ummar</b>	<b>%</b>
<b>Revenue</b>						
<b>Sale form</b>						
Animals	1377.4	1402.2	1584.4	1480.5	898.3	68%
Total dairy production	347.4	354.1	400.2	373.9	226.9	17%
Excludes	74.0	73.6	72.9	76.4	74.9	4%
<b>Home consumed</b>						
Animals	104.4	106.4	120.3	112.4	68.2	5%
Total dairy production	120.5	122.8	138.8	129.7	78.7	6%
Manure	0.0	0.0	0.0	0.0	0.0	0%
Wool or other	0.0	0.0	0.0	0.0	0.0	0%
<b>Subtotal A</b>	<b>2023.6</b>	<b>2059.2</b>	<b>2316.6</b>	<b>2173.0</b>	<b>1347.0</b>	<b>100%</b>
<b>B. Operating cost</b>						
Total Cost of concentrate	754.4	790.7	800.4	684.6	525.8	54%
Total Cost of roughage	60.3	63.3	64.0	54.8	42.1	4%
Total Cost of water	18.1	19.0	19.2	16.4	12.6	1%
Total cost of veterinary	22.1	23.2	23.5	20.1	15.4	2%
Total cost of rent labor	198.8	197.2	245.1	203.2	127.8	15%
Total cost of replacement	116.6	115.9	114.8	120.3	117.8	9%
Total cost of transportation	20.1	31.6	32.0	27.4	21.0	2%
Motility	168.7	143.3	161.9	302.6	78.7	13%
<b>Subtotal B</b>	<b>1359.1</b>	<b>1384.2</b>	<b>1461.0</b>	<b>1429.3</b>	<b>941.3</b>	<b>100%</b>
<b>Fixed cost value</b>						
Total cost of rent land	62.3	50.8	110.6	118.3	47.6	59%
Total cost of rent farm	33.6	27.3	59.5	67.6	22.0	32%
Cost of drinker	4.8	3.9	8.5	8.4	3.7	4%
Cost of feeder	5.3	4.7	10.2	10.1	4.4	5%
<b>Subtotal C</b>	<b>106.0</b>	<b>86.7</b>	<b>188.8</b>	<b>204.5</b>	<b>77.7</b>	<b>100%</b>
<b>E.Total cost of enterprise B+C</b>	<b>1465.1</b>	<b>1470.8</b>	<b>1649.8</b>	<b>1633.8</b>	<b>1019.0</b>	
<b>Net enterprise profit A-E</b>	<b>558.6</b>	<b>588.4</b>	<b>666.8</b>	<b>539.2</b>	<b>328.0</b>	
<b>Number of animals</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	
<b>F. Profit per animal</b>	<b>55.9</b>	<b>58.8</b>	<b>66.7</b>	<b>53.9</b>	<b>32.8</b>	
<b>Revenue to cost</b>		<b>40%</b>	<b>40%</b>	<b>33%</b>	<b>32%</b>	

Appendix (3)

بسم الله الرحمن الرحيم

Questionnaire,

Comparative Analysis of three Productions

Systems of sheep and goats at North and North-east Hebron district)

جامعة الخليل

كلية الدراسات العليا

الموارد الطبيعية والإدارة المستدامة

التحليل النسبي لأنظمة الإنتاج الثلاث لدى الضان والماعز في

محافظة الخليل - شمال والشمال الشرقي للمحافظة

إشراف: د. طلعت ابو رجب التميمي

اسم الباحث: شفاء حسين عمرو

البيانات التعريفية للمنطقة والمزارع

البيانات التعريفية			
اسم جامع البيانات ورقم الهاتف		اسم جامع البيانات.....	
رقم الهاتف:		.....	
منطقة الدراسة	بني نعيم	ححول	بيت أمر
منطقه التجمع (الحارة)			
تاريخ جمع البيانات	/ / 2009		
اسم صاحب المزرعة ورقم الهاتف إن وجد	اسم صاحب المزرعة:.....		
	رقم الهاتف:.....		

البيانات الاجتماعية للمربي وأسرته

البيانات المطلوبة			
الاجابة			
ذكر	اثنى		
جنس صاحب المزرعة؟			
عمر الزماني لصاحب المزرعة؟			
الفترة الزمنية للتربية الأغنام والماعز ( الخبرة )			
مزارع	ربة منزل	موظف	غير ذلك
عامل	طالب	حكومي	
لا يقرأ ولا يكتب	متعلم أساسي	انتهى الثانوية	جامعي
عدد أفراد الأسرة الكلي بما في ذلك الأب والأم		العدد الكلي:.....	
		عدد الإناث:.....	
		عدد الذكور:.....	
		عدد الأطفال:..... ( اقل من 15 سنه)	
عدد أفراد الاسره حسب التقسيم الاجتماعي		عدد المتزوجين.....	
		عدد المتعلمين.....(المدارس)	
		عدد العاملين.....	
		عدد الجامعات.....	

## البيانات الخاصة بالأعمال اليومية

عدد المربين .....	العدد الكلي للعاملين بالتربية الأغنام والماعز	
عدد الذكور .....	تقسيم العمل حسب الجنس	
عدد الإناث .....	العدد الكلي	نوع العمل
عدد الذكور .....		تقديم الأعلاف
عدد الإناث .....		تقديم الماء
عدد الذكور .....		عملية الحلابة
عدد الإناث .....		تصنيع الحليب
عدد الذكور .....		الرعي
عدد الإناث .....		إعطاء العلاجات
عدد الذكور .....		
عدد الإناث .....		

### نظام الإنتاج والتربية التي يقوم به المزارع ؟

التعرف على نوع ونظام التربية من خلال طرح على المزارع عدة أسئلة بسيطة عن نظم الإنتاج وحسب الإجابة يكون نوع النظام المستخدم ( وضع إشارة √ نوع الاستخدام )

استخدام المراعي دائما	القيام بالرعي في فترات خلال العام	بقاء الحيوانات بالبيت
أعلاف من السوق فقط أثناء موسم التناسل	أعلاف من السوق وبقايا محاصيل	أعلاف من السوق طوال العام وعدم استغلال المرعى
النظام السرحي ( الانتشاري )	النظام شبة المكثف	النظام المكثف
		كل نوع من الأنظمة لها أسئلة خاصة

### الأعلاف والبناء المستخدمة للحيوانات حسب المناطق والأنظمة

نوع البناء حسب نظام الإنتاج		حظائر مفتوحة		حظائر مكشوفة	
حظائر شبة مكشوف		حظائر أو غير ذلك		كهوف أو غير ذلك	
الأعلاف المركزة المستخدمة		نخالة	شعير	خلطة مركزة	ذرة صفراء
الأعلاف المائنة		بيكا	ارض المرعى	ذرة حمراء	قمح
قش ، تبن		برسم و بقايا محاصيل		ارض المرعى	

### البناء ومواد الاستخدام (حسب نوع النظام ) مع تقدير المبلغ

البيان	الأدوات والمنشآت				التكلفة الاجماليه	المجموع بالدينار
الارض المبني عليها الحظائر	ارض ميراث	ارض مشاع	ارض استنجاز	ارض شراء		
مواد البناء لمستخدمه للحظائر	اسمنت وطوب	زينك	حجر	غير ذلك		
المعالف	حديد طول	طوب	البلاستيك			
المشارب	اتوماتيكي	طوب	بلاستيك			
العلف	شراء	مراعي	بقايا محاصيل			
الماء	مياه بلدية	مياه أمطار	مياه مشتراة			

## الحيوانات المرباة وعدد وأنواعها

### نوع الحيوان المرعى؟

الضان	العواسي	العساف	خليط منهما	غير ذلك
الماعز	البلدي	الشامي	خليط منهما	غير ذلك

### عدد الحيوانات المرباة مع ذكر التكلفة

عدد ونوع الحيوان	الاعداد الكليه	مجموع التكلفة	ملاحظات
عدد الحيوانات الكلي			
عدد العواسي			
عدد الهجين			
عدد العساف			
عدد الماعز الاسود			
عدد ماعز الشامي			
عدد انواع اخرى			
المجموع الكلي			

### هذا الجزء خاص بالإنتاج الانتشاري ، وشبه المكثف:

### الفترة الزمنية للرعى وطرق الرعى وكذلك أهم معوقات التي تحول دون الرعى بالمرعى

1. أين تقوم برعى القطيع ؟
  - ✓ في القرية وما حولها
  - ✓ في المناطق الجبلية
  - ✓ في الحقول واليساتين
  - ✓ على جوانب الطرق
  - ✓ في المرعى
2. من يملك ارض المرعى ؟
  - \* ارض مملوكة للأسرة \* ارض مشاع \* ارض حكوميه \* أملاك خاصة للغير \* استئجار
3. ما هو نظام الرعى المتبع لديك ؟
  - ✓ متواصل ( التقليدي )
  - ✓ دوري
4. متى تبدأ عملية الرعى ومتى تنتهي ؟

عملية الرعى	في الصيف (ساعة)	في الشتاء (ساعة)
تبدأ عملية الرعى الساعة .... وتنتهي .....		
الفترة المسائية تبدأ ..... وتنتهي .....		
عدد الساعات اليومية للرعى		
مجموع الساعات الكلي باليوم		

5. مجموع الأيام الكلي للرعى ؟ .....
6. من يقوم بعملية الرعى للحيوانات
  - ✓ لوحدك
  - ✓ برفقه العائلة
  - ✓ ضمن مجموعه غير الاسره
  - ✓ استخدام عامل ( أجرة )
  - ✓ احد أفراد الأسرة
7. هل هناك معوقات لعملية الرعى ؟ ..... في حال الاجابه بنعم ما سبب هذه المعوقات
  - ✓ أسباب أمنييه
  - ✓ أسباب اجتماعيه
  - ✓ أسباب بيئيه
  - ✓ قرب المرعى من المستوطنات
  - ✓ جدار الفصل
8. هل تتوقف عن إعطاء مواد اضافيه غلفيه؟ ..... إذا كان الجواب بنعم
  - ✓ أثناء فتره الرعى
  - ✓ عند نقص المرعى

- ✓ لا أتوقف عن إعطاء العلف
9. ما هو مصدر العلف المستخدم بالمزرعة
- ✓ الجمعيات التعاونية
- ✓ السوق
- ✓ الأراضي المملوكة للأسره
- هل تنتقل من منطقة إلى منطقة أخرى طلباً للرعي ؟ .....
1. من يقوم بالانتقال مع قطيع الحيوانات ؟ جميع الأفراد الأب والأم بعض أفراد الاسره
2. الي أي المناطق تنتقل ؟ داخل المحافظة الأغوار شمال فلسطين منطلق أخرى ؟
3. في أي الأشهر تنتقل للرعي خارج منطقتك ؟ وما هي الفترة التي تقضيها هناك ؟
4. لماذا تنتقل إلى هذه المناطق ؟ لأسباب
- \* سياسية \* اقتصادية \* اجتماعية \* بيئية \* غير ذلك ؟
5. ما هي صفات المراعي التي انتقلت إليها ؟
- \* ممتازة \* جيدة جداً \* جيدة \* متوسطة \* غير ذلك ؟
10. ما هي أهم المعوقات التي توجهك إثناء الرعي بالمرعى واستخدام الطريق التقليدية ؟

### هذا القسم يشمل نظم الإنتاج المختلفة ( الانتشاري ، شبه المكثف ، المكثف )

1. كيف ترى تربيته الضان والماعز مستقبلاً ؟

✓ ثابت

✓ متزايد

✓ متناقص

2. كيف يمكن التحسين من أنظمة الإنتاج المختلفة ؟

3. ما هو النظام التي قد ينتشر مستقبلاً ؟

4. هل تستخدم السجلات ؟ وإذا كان نعم لما ؟

### تقدير تكلفه ومبيعات الإنتاج

### تقدير ثمن مدخلات الإنتاج للمزرعة

المبلغ الكلي	الثلث	الكمية بالشهر	المواد المستخدمة
			خلطة مركزه (تسمين )
			علف مركز (قمح ، شعير ، ذرة ، نخالة)
			العلف المائي
			علاجات وداويه بيطريه
			الماء
			أجور عمال
			إضافات أخرى
			أجرة نقل
			المجموع

### أهم منتجات الضان والماعز خلال العام الواحد

ملاحظات	الاستغلال المنزلي	مكان البيع	الثلث	الكمية	نوع المنتج
					الحليب السائل
					اللبن الرائب
					لبن الجرجب
					اللبن الجميد
					الزبد
					السمن
					مواليد بعد القطام
					مواليد التسمين
					استبعاد
					النفوق

شاكر لكم حسن تعاونكم

المهندسة: شفاء حسين عمرو

ملخص البحث

**التحليل النسبي لأنظمة الإنتاج الثلاث للضان والماعز في الضفة الغربية  
(منطقة شمال وشمال- شرق الخليل)**

هذه الدراسة تبحث في وصف وتحليل أنظمة الإنتاج لدي الضان والماعز في شمال وشمال-شرق محافظة الخليل، ومن ثم تحديد أفضل أنظمة الإنتاج التي يمكن استخدامها في منطقة الدراسة مستقبلا. نظرا لعدم توفر الدراسات السابقة عن هذا الموضوع في منطقه الدراسة فان الهدف الرئيس للبحث هو المقارنة بين أنظمة الإنتاج الثلاث للضان والماعز من خلال التعرف على أهم الخصائص الاجتماعية-الاقتصادية لأفراد الأسرة وكذلك التعرف على أهم مدخلات ومخرجات نظم الإنتاج ومن ثم تحليلها اقتصاديا.

تعتمد النتائج في هذه الدراسة على المسح غير الرسمي و الرسمي من خلال تنظيم الاستبيان، الذي شمل عينة عشوائية من 150 من مربى الأغنام والماعز، وركز الاستبيان على الفترة الاقتصادية الزراعية لعام 2008-2009.

تبين من نتيجة البحث أن المرأة تشارك ب 45 % من الأعمال اليومية لمزارع الضان والماعز، وتظهر الدراسة أيضا أن تربيته وإنتاج الضان والماعز يقتصر على الفئة العمرية ما بين 30-69 عاما حيث شكلت 81% من أعمار مربى الضان والماعز ، وبسبب التوسع العمراني والظروف الجوية، نلاحظ أن الإنتاج الانتشاري اخذ بتناقص على الرغم من ارتفاع ربحية الرأس الواحد حيث تقدر ربحية الرأس من الحيوانات ب 55.8 دينار أردني في نمط الإنتاج الانتشاري.