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**List of Abbreviations**

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<td>ACF</td>
<td>Action Against Hunger</td>
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<td>Facility for New Market Development</td>
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<td>Gaza Strip</td>
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<td>Jordanian Dinar</td>
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<td>UAWC</td>
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**Key Definitions**

**Weaning**
Weaning is a crucial time in the management of ewes and lambs. It is the practice of removing lambs from the milk diet provided by the ewe (or a milk replacement diet) onto forage or grain-based diets. The latter leads to faster growth and higher meat yield. The separation can be stressful for both ewes and lambs if not managed properly. Proper weaning procedures aim to minimise stress and ease the transition.

**Abortion**
This refers to failed pregnancies, which can be induced by multiple factors, particularly including disease and physical injuries. Often, abortions are facilitated by vets. The abortion rate directly reduces the number of new born lambs.

**Colostrum**
Colostrum is a type of milk that is produced by ewes during late pregnancy or directly before giving birth. It contains antibodies and a high concentration of proteins and fats, which protects newborn lambs against disease.

**Lactation**
The period during which new born lambs receive natural milk from ewes for up to 2-3 months. Sometimes this is replaced with alternative milk.

**Lamb**
Young sheep are generally referred to as lambs.

**Mutton**
Mutton is the meat from a sheep which is more than one year old. Mutton has a stronger flavor than lamb and is usually comparatively less preferred by consumers.

**Yearling mutton**
A yearling is a sheep between 1 and 2 years of age.
Executive Summary

This study analyses the market system for weaned lambs in the OPT. It was conducted in collaboration between Development Pioneers and PMDP. The findings are based upon primary research and field stakeholder engagement through questionnaires, focus group discussions, and key informant interviews. Key stakeholders include sheep farmers, traders, livestock input suppliers, academia, and the Ministry of Agriculture (MoA). To validate findings, PMDP also conducted two workshops with a cross-section of these stakeholders.

The livestock sector is one of the most important contributors to the Palestinian economy in terms of value added, livelihoods, and food security. Livestock products (meat and milk) in the oPt were valued at around $445 million in 2008. It involves thousands of low-income livestock farmers, approximately 34,000 livestock households, and millions of consumers of livestock products. Sheep production (along with goats, cattle, and poultry) is one of the main livestock subsectors.

The market system for weaned lambs was selected for deeper assessment following a review of the sheep and goats subsector in the oPt, which highlighted the fact that consumption of lamb meat has been falling due to high prices, and that more than 50% of the contribution to retail meat price is incurred during weaning. Potential increases in efficiency during this process can increase farmer margins, reduce prices, and increase meat output.

Weaning refers to the process of separating newborn lambs from the parent ewes at approximately 60 days of age in the WB and 90 days in the GS. Newborn lambs are switched from their initial milk diet (provided by ewes) to forage or grain based diet. Weaning allows lambs to efficiently convert grain/forage feed to lean tissue (as compared to receiving milk from ewes and converting that to tissue).

The market system consists of livestock (lamb) keepers on the supply side, and traders and consumers on the demand side. Supporting functions constitute of input supplies (i.e. concentrated feed, alternative milk, equipment, information and infrastructure). Rules include local regulations and informal norms. Traders perform a dual function – they both purchase and fatten lambs before on-selling.

Demand for sheep meat is not consistent, and tends to increase during holiday periods (such as Eid Al-Adha). Consumers prefer freshly slaughtered meat, and generally prefer younger animals. According to PCBS statistics from 2011, the total sheep flock size is 732,399 of which 669,843 are in the West Bank and 62,556 in Gaza. The best seasons for selling weaned lambs to traders/fatteners, is 2-4 months ahead of the Haj, Eid Al Adha, and Ramadan (the start of which moves back 10 days each year). Demand for sheep also goes up during the wedding season (over June/July). Traders/fatteners prefer to buy lambs (about 2-3 months old, weighing 20-30 kg) about 2 months ahead, fatten, and sell them off. The key characteristics of demand include:

- Consumption of sheep and goat meat has been falling in favour of beef and poultry. The DFID and World Bank financed Facility for New Market Development (FNMD) report on the sector indicated that per capita poultry consumption almost doubled between 2005
and 2009. Meanwhile, per capita red meat (including beef, sheep, and goats) consumption fell by 15% over the same period.

- Rising prices have been the key driver of the decrease in sheep and goat meat consumption. The current price for fresh sheep and goat meat is NIS 80/kg (WB & Gaza). By comparison, fresh beef costs NIS 40-60 in Gaza and NIS 55/kg in WB, frozen beef costs NIS 23/kg in Gaza and NIS 28/kg in the West Bank, and fresh poultry (chicken) costs NIS 10/kg in Gaza, and NIS13/kg in WB.

Traders form the main link between farmers and final consumers (though some sales also occur directly through wholesale markets). They perform multiple functions, including purchasing young weaned lambs and goats, feeding and fattening them, and selling them. These functions are not performed exclusively by traders, as some farmers also perform breeding and feeding before selling the lambs either to butcheries or directly to consumers. The major traders in the West Bank are Al Junaidi, Al Waha and Modern Harvest Company. While in GS some traders are most known such as Abu Rabie, Abu Khousa, Al Atram, Abu Mashi, Malalha and Al Shaer. Most traders prefer intensive breeding and also have a preference for the Assaf strain (which tends to yield greater meat output and is preferred by customers).

The main production models in OPT are extensive, semi-intensive, and intensive. The sheep population is split roughly 25%/75% between extensive production and intensive /semi-intensive production. The heard is concentrated in Hebron (33%), Jenin (18%), and Nablus (13%).

Production can be organized into small scale, medium-scale, and large-scale farmers. Small herders utilize all three types of production systems and dominate the extensive system, while medium-sized and larger producers use semi-intensive and intensive production.

Following birth, lambs are nursed by mother ewes, initially receiving colostrum followed by natural milk. After this initial period, as the lambs grow, they are gradually switched to a forage/grain based diet (i.e. weaned off milk). Weaning refers to this transition. The advantage of weaning is that it results in an increased growth rate, as lambs are better at converting grain, rather than milk, to meat. The duration of weaning, as well as the timing and type of milk used, are variables which can be adjusted to increase efficiency and resultantly, herder income.

Investigation of weaning norms shows a significant reliance on practices which inhibit competitiveness. This includes the lack of provision of adequate animal housing, hygienic conditions, ventilation and temperature control. Additionally, the vast majority of sheep farmers (95%) are currently utilizing natural lactation, while sheep rearing in countries with more advanced livestock sectors has transitioned to alternative lactation. Maintenance of proper production records is also not common. Furthermore, animal health management has been identified as a key problem area by nearly all stakeholders concerned with developing the sector. It is well established that farmer knowledge of animal health is generally low, and lamb mortality rates are high, between 10-30%. These conditions indicate that the veterinary services market is malfunctioning – a problem which merits further investigation and potentially intervention.

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1 See Figure 15, value chain map.
Key supporting services required for weaning include the provision of sound technical information to farmers, the availability of cost effective equipment, availability of concentrated feed and alternative milk, and veterinary services and vaccine. While inputs including equipment, feed, milk and vaccine are generally available, the particular challenge is convincing farmers of the business case for productivity improvement, and facilitating the sustainable supply of quality technical information to assist the transition to improved practices in lactation and animal health.

The sector overall also suffers from lack of adequate governance. Several of these gaps are discussed in the study; however the key areas where improvements can be made are in exploring new models for the delivery of veterinary services and technical information, regulation of quality standards for input supplies, and control of illegal imports.

The market has significant development impact potential, with approximately 75% of livestock farmers being small and medium scale producers. Additionally, while women only make up 5% of livestock holdings, they provide a significant portion (25%) of (normally unpaid) farm labour, and there are concrete opportunities for them to benefit from increased competitiveness. E.g. through engagement in the management and sale of milk and dairy derivatives.

The study also found that there have been several initiatives to support the livestock sector, primarily financed by international cooperation agencies. The initiatives can be classified by the following three categories: a) technical support through training and raising awareness, b) in-kind support through distribution of sheep and fodder, and c) in research and development. Evidence indicates that a majority of the initiatives have entailed donation of livestock and direct subsidy of farm inputs (particularly to the vulnerable farmers), rather than market-led approaches. Fairly limited attempts have been made specifically to enhance weaning practices.

Weaning practices have not changed significantly over the years; however there are forces at work which will gradually create impetus for increasing productivity to maintain incomes. Key driving forces affecting the system include the rising cost of inputs, declining economic circumstances, a consumer shift to substitutes, and malfunctioning veterinary services.

With a population growth rate of 3%, the demand for lamb meat will continue to rise. There is an opportunity for farmers to take advantage of this through increased productivity and better flock management, which would result in higher margins, growth of the herd, and a decrease in prices for end consumers. The report discusses several pathways to increased competitiveness, including improving farmer practices in breed management, animal housing, lactation, feeding, business management, and on-farm animal health management. The report particularly highlights the opportunity to increase profit margins for farmers by up to 11% (from 22.5% to 33.8%, or NIS 259.5 to NIS 389.5) per weaned lamb by switching from natural to alternative lactation. There are additional opportunities in upgrading veterinary services and in encouraging the public-sector to consider more innovative mechanisms for service delivery.

The report concludes with identification of interventions which have the potential to upgrade competitiveness of lamb weaning in oPt. The challenge for stakeholders concerned with improving the subsector will be to pursue a selection of these in a manner that can result in increases in output and efficiency, albeit sustainably.
Study Objectives

The study analyses the market system for weaned lambs. Its key objectives are to:

1. Develop a clear understanding about the demand for weaned lambs.
2. Understand the supply (production) of weaned lambs in OPT, and identify constraints to increased competitiveness.
3. Analyse supporting functions. i.e. supporting goods and services required by the weaned lambs market system (such as input supplies, information, infrastructure, finance, etc.)
4. Identify and map the weaned lambs value chain and its connection to end markets.
5. Analyse rules and regulations: assess how formal policies (such as those set by the Ministry of Agriculture) and informal norms shape the enabling environment for the system.
6. Assess what role (if at all) low-income individuals and women play in the system.
7. Identify the operations of other donors in the sheep sub-sector
8. Identify the key constraints preventing the market system from moving to a higher level of competitiveness.
9. Map the pathways and potential interventions that can lead to enhanced growth and competitiveness in the market system.

Rationale for Investigating Weaned Lambs

PMDP identified livestock as a high potential sub-sector during its inception phase, after assessing its potential to add to agricultural economy, generate social impact, and how well the sub-sector might lend itself to potential PMDP interventions.

Livestock is the second largest contributor to agricultural output in the OPT after plant production. According to the PCBS, there are a total of 34,000 mixed and pure livestock keepers, holding an approximate total of 732,399 sheep (669,843 West Bank, 62,556 Gaza). The sector contributes about $332 million, the equivalent of 40%, of agricultural GDP, and is a significant source of employment. PCBS's Livestock Survey 2013 stated that there were 8,628 paid livestock workers during 2012-13, split 75%/25% between the West Bank and Gaza respectively. About 70% of these are temporary workers. Additionally, unpaid workers (farm labour, normally family members), amount to 82,765 workers (83.3% in the West Bank and 16.7% in the Gaza Strip). 80.4% of these are permanent.

While international donors have supported the livestock sector over the years, it continues to perform below its potential. The overall sub sector is well mapped out but detailed information on smaller (but critical) market systems within it (such as weaned lambs), is hard to come by.

PMDP identified such a gap in lamb weaning, and proceeded to conduct deeper analysis of this key function in the sheep value chain. The need for analysis was reinforced by the fact that a large share of the costs of lamb meat ($140 million out of an overall market of $225 million) is tied to the weaning process. Inefficiencies in the system could be contributing significantly to higher sheep meat prices, which have been rising at a significant pace.

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2 This assessment is based upon the market systems approach.
3 See: PMDP Inception Report, 2013
5 EU Agriculture and Livestock Support Programme, 2011
6 It was surprising that greater costs were being accrued during weaning than fattening, the next stage in the process.
Overview: The Sheep Sub-Sector

The PCBS reports that sheep and goat farming represents about 46% of livestock in OPT. PCBS data also shows that 92% of those breeding livestock are men, and 55% of livestock farmers are between 45 – 65 years old. In terms of education, 67% of them have completed school education, 10% of them finished university, while the remaining are illiterate. Over 60% of livestock households (34,000) keep sheep, 30% goat, and about 10% cows.

![Figure 1: Distribution of livestock households in the Palestinian territories](source: BCPS 2013)

The total sheep population is significantly higher than goats. However, both populations have declined since 2006.

![Figure 2: Sheep and goat production from 2006-2015](source: Ministry of Agriculture, PMDP Analysis.)

There are conflicting statistics available about the total population of sheep in Palestine. In this case, PMDP has decided to utilize figures available from the Ministry of Agriculture up until 2013;
figures for 2014 and 15 are estimates, derived from consultations with sector experts. However, it is well established that the sheep heard has been on the decline since 2006/7, due in particular to shrinking grazing lands, high and rising cost of inputs, and high animal mortality.

The estimated value of weaned lambs in the OPT amounts to between $250m (current levels) to $400m (potential). The overall heard is split between males and females, in an approximate ratio of 20%/80%. At this rate, the current derived population of ewes in OPT would be 440,000.

The leading sheep variety in OPT is Awassy (55.7%), which is a local variety, followed by Assaf and other strains (44.3%). Assaf is an imported variety which is popular in Israel. It is known for certain advantages such as higher yield of milk and meat, however, farmers often complain that Assaf sheep are more vulnerable to disease.