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Awassi Sheep Production System and Feeding Strategies in Syria

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Introduction

Syria covers an area of 185,000 km², of which about 55% has less than 300 mm of rainfall annually. There are about 8.3 million hectares of steppe and pasture - 45% of the total land area -. Sheep are the most important livestock resource, being found across most regions of the country. The fat-tailed Awassi is the main breed. It is famous for its meat and milk products and is known for its ability to tolerate heat, drought, cold and cold treks (Epstein, 1985). There are about 11.5 million heads of Awassi, contributing 78%, 30% and 100% of the country's total red meat, milk and wool production, respectively (FAO, 2006). The husbandry system in the country is characterized by extensive, semi-intensive, and intensive. The major sources of sheep feed in Syria come from natural pastures and rangeland, cultivated green and conserved fodder, as well as crops and by-products and residues from agro-processing. Grazing in Al Badia, which is classified as rangeland, provides the most important source of fodder for sheep and covers an estimated 15 percent of the national sheep flock's nutritional requirements in a "normal" rainfall year. Barley accounts for more than 85 percent of feed grown for sheep (Cummins, 2000). The main agricultural stubbles are wheat, barley and cotton. Cotton seed cake provides the major source of supplementary protein to grazing animals. Wheat bran and straw are the most important crop by-products. During the last five years the international market price for cereals have doubled, e.g. in 2004 the price of wheat was 161 \$ /ton and in 2008 378\$, and the maize price per ton was 111\$/ton in 2004 raising to 243\$/ton in 2008 (FAO, 2008). The feedstuff prices in Syria followed those on the world market. The availability and cost of feed and fodder is regarded as a major constraint to increasing the livestock production and the profitability of sheep enterprises. The objectives of this study are to describe the production systems of Awassi sheep in Syria and to identify the feeding strategies of the sheep keepers.

Materials and methods

The distribution of Awassi sheep in Syria

Syria has five major ecological zones mainly based on the rainfall distribution. Awassi sheep are found all over the country but concentrate in areas with lowest rainfall.

Sampling and questionnaire methodology

1- Study area: The country was divided into four major geographical regions which explained in the following table (table 1):

Table 1: *The differences between the four studies areas*

Study area	Southern area	Central area	Northern area	Eastern area
Governorate	- Damascus sub - Dar'a & Sweida	- Homs - Hama	- Aleppo - Al-Raqqa	- Dair Ezzor - Al-Hassake
Area (ha)	2,729,813	4,969,455	3,811,586	5,639,359
Steppe & pasture (%) *	57	61	31	44
Irrigated land (%) *	4	3	0,1	19
Crop types	Wheat, barley	Wheat, barley, maize, cotton, sugar beet & sunflower	Wheat, barley, maize, cotton, sugar beet & sunflower	Wheat, barley, maize & cotton
Sheep population (%) **	13	27	28	28
Milk production (%) **	13	30	27	25
Meat production (%) **	12	29	30	24
Road, electricity, water	+++	+ (+)	++	+

* : of the total land of the study area.

** : of the total sheep population, red meat and milk produced in the country

2- Data collection: A set of detailed structured questionnaires were prepared and used to collect information from sheep keepers across all areas in a “one visit interview” during summer 2006 and 2007 (22 from southern area, 26 from central area, 20 from eastern area and 37 sheep keepers from the northern area). The questionnaires were pre-tested to check clarity and appropriateness of the questions. Some of the information collected during interviews was supported by observation. The questionnaires were designed to obtain information on general information about the sheep keeper, livestock and flock structure, flock management, breeding practices, disease prevalence, production objectives, feeding management and production constraints, formal and informal institution and organization involved in the system.

3- Data analysis: The SPSS statistical computer software (SPSS for windows, release 14.0, 2005) was used to analyze the data. Results are presented mainly in the form of descriptive tabular summaries. Chi-square (χ^2) or t tests were carried out when appropriate to assess the statistical significance or otherwise of particular comparisons.

Results

Production system

The questionnaire survey showed that, 59% of all sheep keepers (n= 62) grow crop themselves, with clear differences between study areas. Only 13.6% of the sheep keepers produce crops in the south area, while in central, northern and eastern area 76%, 67.6% and 70% of them produce crops, respectively. Barely and wheat were mainly produced, however, only 22% of the respondents' indicated that they have sold crops within 12 months preceding the interview. Three types of husbandry system have been recognized (extensive, semi extensive, intensive) and the distribution was significantly different for semi extensive and intensive husbandry system between the studies areas (table 2).

Table 2: *Distribution of sheep keepers according to the type of husbandry system*

Husbandry system	P	Southern area N = 22	Central area N = 26	Northern area N = 37	Eastern area N = 20
Extensive (%)	ns	4.5	36	13.5	25
Semi extensive (%)	*	59.1	60	81.1	70
Intensive (%)	*	36.4	4	5.4	15

ns: not significant

* = $p < 0.05$

78% of sheep keepers used only family labour in looking after their flocks, and the rest used to hire foreigner labor for flock services and grazing. The owners themselves are involved in all farm activities, especially in management.

Feeding strategies of Awassi sheep keepers in Syria

Grazing provides the most important source of fodder for sheep, but only 38.7% practice grazing of flocks. East-west movements were mentioned due to the feed and fodder availability. During rainy season (November to end of April) the sheep keepers used to move to the East in direction of Al Badia region where the rangeland and natural pasture grew up. During dry season (May to end of October) sheep flocks moved into irrigated cropping area in the west, where the sheep are grazed on crop residues. Those mobile sheep keepers are not equally distributed among the studies areas; as well as, the percentage of them is affected by the season table 3.

Table 3: *Distribution of mobile sheep keepers according to the study area and season*

Season	P	Southern area N = 22	Central area N = 26	Northern area N = 37	Eastern area N = 20
Dry season	***	4.5	53.8	67.6	20
Rainy season	**	4.5	38.5	10.8	25

** = $p < 0.01$

*** = $p < 0.001$

To maintain feeding levels over extended periods of the year the interviewed sheep keeper mentioned the necessity of concentrate supplementation fed to the whole flock. Barely grain, bran and cotton seed cake are most important in all study areas (96%, 98% and 98%, correspondingly). Maize is often used in the southern area (27.3%) compared with 3.9%, 5.4%.0% in the northern, middle and eastern region. No significant difference is recognized between region for cotton seed (35%, 23.1%, 13.6%, and 13.5% in eastern, central, southern, and northern area, respectively). Despite the fact that wheat is used for human consumption, about 20% of the sheep keepers interviewed used it as a feedstuff. The use of dried bread is increasingly common in the eastern area (35%) compared to 9.1%, 3.9%, and 2.7% in the southern, middle and northern area. Legume grain are also used, but only in the central and northern area (7.7%, 5.4% of the sheep keeper, correspondingly) table 4.

Table 4: *Distribution of sheep keepers according to the feedstuffs used in feeding their flocks*

Feedstuffs	P	Southern area N = 22	Central area N = 26	Northern area N = 37	Eastern area N = 20
Bran	ns	100	96.2	97.3	100
Cotton seed cake	ns	95.5	100	97.3	100
Barley grain	ns	95.5	96.2	97.3	90
Maize	**	27.3	3.9	5.4	-
Wheat grain	ns	18.2	26.9	18.9	15
Cotton seed	ns	13.6	23.1	13.5	35
Bread	***	9.1	3.8	2.7	35
Legume grain	ns	-	7.7	5.4	-

ns: not significant

** = $p < 0.01$

*** = $p < 0.001$

This study shows three sources of feed and fodder:

- Government agencies: a. the government procures; stores and markets feed and fodder through the General Establishment for Cereal and the General Establishment for Fodder.
- b. the cooperative sector. The Peasant Union Federation distributes the feedstuffs with supported prices but in a limited quantity 4 kg for each lactating ewes registered by the

- Peasant Union Federation (barley grain, wheat bran and cotton seed cake) per season (6 months) 96% of the sheep keepers used to by the feed from these government stores.
- Markets: 96% sheep keeper purchase feed on the private sector markets or directly from producers.
 - Owen feed produced: 57% of sheep keepers cultivate barley or wheat to produce some additional feeds and fodder. None of the sheep keepers produced enough feed and fodder which cover the flock request all the year.

The effect of feedstuff price increasing on sheep production in Syria:

All herders interviewed complain about increasing feed cost and decreasing supply of feed supported from government outlets. Nowadays they got 4 kg (wheat bran, cotton seed cake and barley) for each lactating ewes from the government store per season (six months). The price of supported feedstuff is 3-5 SL less than markets prices. The market price for barley reach this year 17 SL per kg (50 SL = 1 US \$) however it was 13 SL/kg one year before. Wheat bran is controlled by government but is sold for a higher price (16 SL/kg) in private feed stores; this is illegally. To face the change on feedstuffs prices all sheep owners verify that they have sold ewes last year to buy feed for the rest of flock. Some of them sold all their animals and change to another occupation for their living. As a consequence the price of mutton and sheep milk increased. The mutton price reach 145 SL per kg (living weight) and sheep milk price 35 LS per litter, while the mutton price was 100 per kg (living weight) and 20 SL for one litter milk in the previous year

Conclusions

Syria's sheep production systems are changing. The sheep husbandry system in all areas is semi-extensive and it showed a trend of intensification. Grazing natural pasture, rangeland and crop residues are the main feed resources for sheep. An increasing proportion of the dietary requirements of sheep are met through supplementary feeding with cereal like (barley, maize and wheat), using by-products from crops and agro-processing for example bran and cotton seed cake. There is an increasing need for feeding of concentrates due to a decreasing reliance on natural grazing alone. The systems have changed from methods of low input and low productivity to more intensive feedlots. However, this system is now threatened by increasing prices of feed grain and concentrates affecting the economic sustainability of sheep production in Syria. Either product prices can be raised to offset the cost or sheep keepers will look for alternate sources of income.

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