



Original article

Rabbit Meat Commercialization: Particularities and Constraints in the Region of Tizi-Ouzou (Algeria)

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Abstract

This paper investigates the marketing and channels of sale of rabbit production in Tizi-Ouzou area (Algeria). Data collected by questionnaire were subjected to descriptive and principal component analysis. 240 to 12 800 rabbits were sold alive/breed/year, either an average of 1342 rabbits sold/breed/year. Half of rabbit farmers sell their rabbits to slaughter houses or to wholesalers. 19% sell them to hotels and restaurants while 18% to butchers and 13.5% directly to the consumer. The sale price of alive rabbits (2.45 ± 0.13 Kg) depending of marketing circuit, he is of 360 and 400 AD/Kg (2.70 € and 3.00 €/Kg) for wholesale; and between 500 and 550 AD/Kg (3.75€ and 4.12 €/Kg) for retail. This difference in selling prices led rabbit breeders to choose the direct sales channel rather than selling to an intermediary. The marketing circuit of this product is disorganized, result of several problems such as the too low selling prices, high transport costs, late payments and low demand for the product.

Keywords: Algeria, Constraints, Marketing, Rabbit farmers, Rabbit's meat.

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INTRODUCTION

Rabbit breeding in Algeria has been marked by a new relaunch in recent years. This development is supported by the various financing mechanisms for the development of rabbit farms set up by the authorities to promote animal production and diversify the supply of animal protein (Mouhous et al., 2020), as well as the state aid for the establishment of new rabbit breeders (Mouhous et al., 2019). However, rabbit meat production remains very low compared to other productions, representing only 5% of total white meat production (DSA, 2017). According to data from the Ministry of Agriculture, the rabbit population identified in thirteen regions across the country reached 36,667 rabbits does in 2016 (MADRP, 2017). With an estimated production of 8250 tons in 2013, Algeria is ranked tenth in the world (FAOSTAT, 2013).

The rabbit meat production sector, which could be one of the important levers for the development of meat production in Algeria, is characterized by a lack of organization and structure that affects all its segments; feed, breeding and commercialization (Mouhous et al., 2019). Even though rabbit breeding in the traditional way has always existed in Tizi-Ouzou (Djellal et al., 2006).

In terms of rabbit farming, the region of Tizi-Ouzou has several assets compared to other regions of the country: the large number of rabbit farms in the region compared to the national level, the organization of livestock farmers in association (Association of rabbit farmers), the presence of the multi-purpose cooperative, which gives great importance to this sector, and the presence of two slaughterhouses specialized in rabbit slaughtering. Accordingly, Tizi-Ouzou is one of the most important region for rabbit breeding in Algeria, given to the large number of farmers established in this area (Mouhous et al., 2019). Also recently, Kadi et al. (2020) reported that, especially in Tizi-Ouzou region, that it is the insufficient availability and the high prices that are the major obstacles for rabbit's meat consumption.

Accordingly, the aim of this study is to identify the rabbit marketing channels for a better understanding of this segment in particular the marketing of rabbit meat, in the Tizi-Ouzou region.

MATERIALS and METHODS

Survey conduction

Our survey data were collected using a structured questionnaire administered to 67 rabbit breeders. The questionnaires aimed the modern rabbit farms in the Tizi-Ouzou region. As for the farms to be investigated, our approach was based on the exhaustive nature of the survey to reach all rabbit producers in the study area. This objective was justified by the meeting of the different conditions for carrying out this work.

The questionnaire used consists of multiple-choice answers for questions. The information collected from farmers concerns the quantities sold and the nature of the product, the weight of the rabbit for sale, the selling price, the transport cost, the marketing policy, the trade circuit and the constraints encountered.

Statistical analysis

All data were organized and subjected to a descriptive analysis (frequencies, standard deviations,.. etc), and to a multi-varied analysis like the main component analysis type (PCA), carried out using the following variables: female population, number of subjects sold per month, average weight of subjects sold, main customers, sales rate outside the region, the existence of sales contracts and advertising practice. The PCA was followed by a hierarchical bottom-up classification (HAC using the Ward method). The software used is XLSTAT@ 2014.

RESULTS and DISCUSSION

Female numbers

The size of the rabbit farm is substantially variable (Table 1), the average is 42 females, 7 males and 175 fattening rabbits. This number range between 8 and 250 breeding females. However, it is interesting to note that three rabbit farms have more than 180 rabbits does in production. As a rough guide, according to ITAVI (2017), average size of a rabbit farm in the most productive rabbit meat countries in Europe ranged from 500 rabbits does in Belgium to 1000 in Italy and Hungary, with a minimum of 200 in France and Belgium to 300 in Hungary, Italy and Spain.

Table 1. Female numbers in the investigated rabbit farms

Number of rabbit does (class)	Proportion (%)
1-10	7
11-25	42
26-40	18
41-70	19
71-180	11
+180	3

Average farm size in this region is increasing significantly. Regarding the number of rabbits does in production, the results obtained in this study (42 rabbits does in production/rabbit farm) are 45% higher than those reported for the same region by Zerrouki et al.(2005), i.e. 29 rabbits does in production per rabbit farm.

Rabbit farming

The results of the survey showed that 42% of rabbit farmers have received support from the state through its various mechanisms to start their activities. According to Mouhous et al. (2019), the

effectiveness of these aids remains relatively low and rabbit farmers are more interested in technical assistance than in livestock start-up assistance.

The farmer and his family members, for all farms, provide the labor, the number of persons is very variable (Table 2). This family workforce is very solicited because of average farm size and in order to minimize expenses.

Table 2. Situation of rabbit breeders in the region of Tizi-Ouzou according to star-up aid and family labor

		Number of farms	Proportion (%)
State start-up aid	Yes	28	42
	No	39	58
Family labor	Breeder only	10	15
	Breeder and one family member	41	61
	Breeder and two family members	16	24

Commercialized quantity and nature of the product

At the end of the fattening period, all rabbit farmers direct their production towards marketing. The quantity sold vary between 240 and 12800 rabbits per rabbit farm/year with an average of 1342 rabbits \pm 1879 sold/rabbit farm/year. Indicatively, the average production in France was 5120 rabbits/rabbit farm/year in 2017 (Lebas, 2018). The average self-consumed quantity is 17 rabbits per farm/year, and the free quantity offered is 13 rabbits per farm/year.

Most of interviewed rabbit farmers (78%) sell their rabbits exclusively alive either to the collector or to the slaughterhouse, 6% sell them exclusively slaughtered, while 16% of the rabbit farmers sell their rabbits either alive or slaughtered according to the customer's demand. Also in countries where rabbit meat is produced in very large quantities (several million carcass/year), as reported by European Union (2017), compared to other livestock species, there is a high proportion of rabbit meat from direct and local sales.

It should be noted that the slaughter at farm level is carried out without any sanitary control by an approved veterinarian. Farmers use these practices to increase their profits.

Algerian legislation relating to the presentation and marketing of rabbit meat requires that the carcass must be (Figure 1):

- For fresh rabbit's carcass:
 - The carcass must be completely dressed except for the head, ears and the hind leg tips
 - The carcass must be completely eviscerated

- The finished product must be packaged and labeled
- For frozen rabbit's carcass:
 - The carcass must be completely dressed without any traces of skin.
 - The carcass must be completely eviscerated
 - The finished product must be packaged and labeled



Figure 1. Example of carcass sweating at the slaughterhouse (A) and exposed for sale in the chicken store (B) in Tizi-Ouzou area (Algeria).

Weight and selling price of rabbits

The rabbit is sold either alive or slaughtered; the alive rabbit is sold on average at a weight of 2.45 ± 0.13 Kg, for a price that varies between 360 and 400 AD/Kg (2.70 €/and 3.00 €/Kg) for wholesale and between 500 and 550 AD/Kg (3.75€ and 4.12 €/Kg) for retail. The slaughtered rabbit is sold at a price that varies between 650 and 800 AD/kg (4.87€ and 6.00 €/Kg) for an average carcass weight that varies between 1.3 and 1.9 Kg. This carcass weight is similar to that reported in several studies (Guermah et al., 2011; Kadi et al., 2016, 2018; Hannach-Rabia et al., 2017; Harouz-Cherifi et al., 2018a and b), with the local white population rabbits, carried out in the same region. The prices practiced are close to those advanced by Mezali et al. (2015) in the Algiers region.

Concerning the variation of the selling price, 36% of the farmers questioned stated that it is fixed, while for 64% this price is variable and negotiable. This price variability is essentially linked to the customer as wholesale intermediaries offer lower prices. Thus, it was found that the price of rabbit meat is more expensive for sale than that one of poultry meat, but lower than that of red meat (beef, sheep and goat) (Table 3). We also note that the selling price of rabbit meat has been stable for five years.

Table 3. Comparison of prices of different meats (AD/kg)

	Alive		Slaughtered	
	Whole sale price (AD)	Retail price (AD)	Whole sale price (AD)	Retail price (AD)
Rabbit meat	380 (2.85€)	530 (3.97€)	680 (5.10€)	850 (6.37€)
Sheep meat*	-	-	1294 (9.70€)	1486 (11.14€)
Beef*	830 (6.22€)	830 (6.22€)	1063 (7.97€)	1251 (9.38€)
Chicken meat*	198 (1.43€)	254 (1.90€)	274 (2.05€)	298 (2.23€)
Turkey meat*	-	-	369 (2.77€)	405 (3.04€)

DA: Algerian Dinar. *Source: DSA (2017). 1€ =133.38AD

Transport costs

The transport cost for the delivery of the production is on average 2 100 AD (15.74€)/Delivery. It varies according to the distance and quantity of the production to deliver. This cost is borne by the farmer in 67% of cases and by the client in 33% of other cases, especially for sales outside the region. Of the 67 rabbit farmers questioned, 13 (19%) deliver part of their production outside the region. The regions concerned are Algiers, Blida and Bejaia. This practice has two major advantages: the transport cost is borne by the client and payment is made on site.

Marketing strategy for farmers

Most farmers do not always advertise their products. Only 24% of the farmers questioned use it to make their activity better known. The advertising media used by rabbit farmers are the Internet especially social media, participation in fairs and exhibitions and word-of-mouth.

The current marketing system that based on individual initiatives of rabbit farmers can not, under any circumstances, allow the evolution and development of this sector. It is necessary to opt for a common strategy, developed by advertising and communication professionals. Kadi et al. (2008) had already pointed out the fragility and disorganization of the marketing system in the region.

Regarding the consumption of rabbit meat, in Algeria, there are no religious restrictions to the rabbit meat consumption, as is the case in other countries such as Lebanon where Chalah and Hajj, (1996) report that 18.1% of Shiites refuse to eat this meat for religious reasons.

A national promotional campaign is needed to promote rabbit meat and encourage its consumption; this will increase demand and enhance the product's marketability.

Commercialization circuit

This circuit consists of two main ways (figure 2):

- Either the product passes through an intermediary before reaching the customer's premises, which is the case for half of the farms investigated: 25% sell their rabbits to the two slaughterhouses specialized in rabbit slaughter, and 24% sell them to wholesale intermediaries who themselves carry out the slaughter (uncontrolled). It should be noted that the openness in the region of two slaughterhouses specialized in slaughter of rabbits is an important element in this sector, knowing that there are whole countries among the largest producers of rabbit meat, such as the Netherlands, that have no specialized slaughterhouse according to ITAVI (2017). Moreover, as reported for Mexico by Lopez et al. (2000), in the conditions of the current local market organization, the presence of the wholesale intermediaries seems to be necessary for the sustainability of this production system.

- Either the product is transported directly from the farmer to the customer: 19.5% of the farms investigated deliver their products directly to hotels and restaurants in the region, 18% deliver their rabbits directly to butchers in the region and 10.5% sell their merchandise directly to consumers. These results are consistent similar with those of Kadi et al. (2008) on the type of rabbit meat trade.

We notice that that one rabbit farmer transforms himself his own production by making rabbit terrine or pate in a traditional way, which he delivers himself to the Algiers luxurious hotels. Apart from farmers with a large number of rabbit does who deliver their production directly to slaughterhouses, the majority of rabbit farmers prefer selling their production via a short or direct circuit, this system allows them to increase their profits and to be in direct contact with their customers. The use of this sale system is due to the lack of structure in the rabbit sector. Taking into account the different transactions between the different stakeholders, the marketing circuit is dominated by the informal sector.

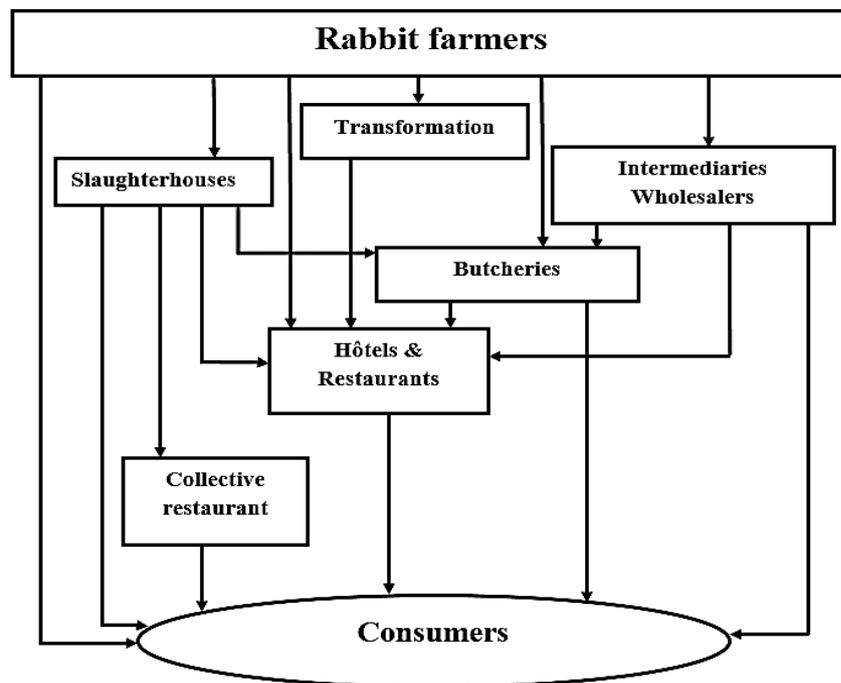


Figure 2. Rabbit meat commercialization circuit in the Tizi-Ouzou region (Algeria)

Constraints encountered during commercialization

The non-structure of the rabbit sector in Algeria leads to major obstacles faced by rabbit farmers, particularly during the selling of their production. These obstacles include the lack of stable markets, the absence in a fluid distribution network, the lack of transparency of transactions and prices setting, expensive delivery costs and late payments.

The majority (28.5%) of rabbit farmers complain about the low selling price of their product and 25.5% of the low demand in the rabbit meat market (Table 4). These two constraints are due to the low consumption of this meat by the population, which is oriented towards other meats like poultry, beef and sheep. This constraint was also reported in the region of Ouargla (Algeria) by Benras (2018). This also leads to late payments, reported by 15% of the rabbit breeders surveyed.

On the other hand, 7.5% of the livestock farmers surveyed insist on the high cost of transport to deliver their production, by the distance between rabbit farms in rural areas, while demand is in urban areas. In addition, 23.5% of the questioned farmers stated that they do not meet any constraints in the practice of their breeding; this category is characterized by a total mastery of breeding practices and marketing channels, thanks to their long experience and technical knowledge.

Table 4. Constraints encountered during the commercialization of rabbit meat by rabbit farmers

Constraints	Proportion %
Low selling price	28,5
Expensive transport cost	7,5
Delayed payments	15
Low product demand	25,5
No constraints	23,5

Typological analysis

The main component analysis (PCA) and the hierarchical bottom-up classification (HFA) identified 4 distinct groups of rabbit farmers. The main characteristics of these groups are represented in Table 5.

Table 5. Characteristics of rabbit meat commercialization in the Tizi-Ouzou region

		G1 (N=10)	G2 (N=10)	G3 (N=27)	G4 (N=20)
Number (females/ Breeding)		113.20 ± 65.02	58.00 ± 23.70	26.85 ± 17.61	19.11 ± 11.52
Sales per month (Subjects/Month)		514.00 ± 454.71	210.00 ± 116.83	107.59 ± 55.78	74.75 ± 50.43
Average weight (Kg/subjet)		2.37 ± 0.11	2.57 ± 0.12	2.42 ± 0.12	2.47 ± 0.13
Main Customers (%)	Slaughterhouses	50	30	40	-
	Whole sale intermediaries	30	50	30	-
	Butcheries	10	-	-	55
	Hotels and restaurants	10	20	30	-
	Individuals	-	-	-	40
	Transformation	-	-	-	5
Sales rate outside the region (%)		90	30	4	0
Sales contract with customers (%)		-	30	22	20
Advertising Practice (%)		30	70	19	20

Through these four groups, we notice that the type of marketing differs mainly in relation to the size of the livestock. Farmers of type 1 and type 2, who have the largest number of females, have better control over the marketing circuit and networks with a diversification of outlets to slaughterhouses, wholesale intermediaries, butchers, hotels and restaurants, whether in the region or outside the region. We also notice that this category of livestock farmers builds customer loyalty; the majority of these farmers have sales contracts with their customers.

Rabbit farmers constituting type 3, with a less number of rabbits sell almost all of their products in the region of Tizi-Ouzou for slaughterhouses, wholesale intermediaries, hotels and restaurants. Only 22% of rabbit farmers have sales contracts with their customers, which explain the difficulties faced by some of them in selling their products.

Breeders of Type 4, represented by very small farms, usually use a short trade circuit with direct sales to butchers and private individuals. Direct retail sales allow rabbit farmers to sell their products (small quantities) at a higher price. In this group, one farmer transforms himself his production in a traditional way by making rabbit pate, this kind of initiative is to encourage because it will allow farmers a better promotion of their products.

Conclusions and Recommendations

At the end of our study on the rabbit meat commercialization in Tizi-Ouzou region, we came to identify the different sales channels adopted by the farmers interviewed. The disposal of the production is done via slaughterhouses, wholesaler intermediaries, hotels, restaurants, butchers and individuals. This circuit is dominated by the informal sector. The selling weight is around 2.45Kg, for a price that varies between 360 and 400 AD/Kg (2.70 € and 3.00 €/Kg).

The problems faced by rabbit farmers to sell their production are the too low selling prices, high transport costs, late payments and low demand for the product. The organization and structuring of the sector across all its segments is one of the main options for the development of rabbit farming in Algeria.

It is recommended that rabbit farmers form "active and efficient" associations and cooperatives in order to allow a better structure and organization of the sector for the eradication of the constraints. A better organization of the sector can allow a better flow of production through regulation and market stability; it will also allow farmers in isolated areas to be connected up by setting up a product collection network.

REFERENCES

- Benras, H. (2018). Contribution à l'étude technico-économique de l'élevage cunicole dans la région d'Ouargla. Etude de cas de l'éleveur de la localité de Bouaameur, master académique, université kasdi merbah Ouargla p73.
- Chalah, T. and E. Hajj (1996). Potentialités de production et de consommation de la viande cunicole au Liban. *World Rabbit Science* 4 (2), 69-74.
- Djellal, F. A. Mouhous and S. A. Kadi (2006). Performances de l'élevage fermier du lapin dans la région de Tizi-Ouzou, Algérie. *Livestock Research for Rural Development*. Volume 18, Article # 100. <http://www.lrrd.org/lrrd18/7/djel18100.htm>
- DSA. (2017). Directory of agricultural statistics of the Wilaya of Tizi-Ouzou. Economic Statistics and Surveys Service. Department of Agricultural Services.
- European Union. (2017). Overview report – Commercial Rabbit Farming in the European Union. Luxembourg : Publications Office of the European Union. 23 p.
- FAOSTAT. (2013). Données statistiques de la FAO, domaine de la production agricole : Division de la statistique, Organisation des Nations Unies pour l'Alimentation et l'Agriculture, Site web : <http://faostat3.fao.org/download/Q/QL/E> Consulté le 24/11/2016.
- Guermah, H., S. A. Kadi and M. Berchiche (2011). Carcass quality of rabbits fed diets with increasing level of Sulla (*Hedysarum flexuosum*). 8th International Symposium on the Nutrition of Herbivores (ISNH8), Aberystwyth, Wales United Kingdom, 6 - 9 September 2011. Ref.0058.
- Hannachi-Rabia, R., S. A. Kadi, C. Bannelier, M. Berchiche and T. Gidenne (2017). La graine de fève sèche (*Vicia faba major* L) en alimentation cunicole : effets sur les performances de croissance et d'abattage. *Livestock Research for Rural Development*. Volume 29, Article #050.

- Harouz-Cherifi, Z., S. A. Kadi, A. Mouhous, M. Berchiche, C. Bannelier and T. Gidenne (2018a). Incorporation de 40% de drêche de brasserie dans l'aliment de lapins en engraissement : performances de croissance, d'abattage et efficacité économique. *Livestock Research for Rural Development*. Volume 30, Article #110
- Harouz-Cherifi, Z., S. A. Kadi, A. Mouhous, M. Berchiche and T. Gidenne (2018b). Effect of increasing level of brewers grains in diets of rabbits on carcass quality and economic efficiency. *Advances in Animal Biosciences*, Volume 9, Special Issue 3 (Proceedings of the 10th International Symposium on the Nutrition of Herbivores ISNH 2018), p522
- ITAVI. (2017). Structure et organisation des filières cynicoles en Europe : Analyse comparée des filières espagnole, italienne, hongroise, belge et néerlandaise. 125p.
- Kadi, S. A., N. Belaidi-Gater, S. Djourdikh, N. Aberkane, C. Bannelier and T. Gidenne (2016). Feeding *Quercus ilex* acorns to fattening rabbits: effects on growth and carcass characteristics. 11th World Rabbit Congress – June 15-18, 2016 - Qingdao, China, 423-426.
- Kadi, S. A., F. Djellal, and M. Berchiche (2008). Commercialization of rabbit's meat in Tizi-Ouzou area, Algeria 9th World Rabbit Congress – June 10-13, 2008 – Verona – Italy. <https://world-rabbit-science.com/WRSA-Proceedings/Congress-2008Verona/Papers/M-Kadi.pdf>.
- Kadi, S. A., A. Mouhous, F. Djellal, Z. Dorbane, A. Hammouche, L. Tabti and H. Guermah (2020). Factors influencing rabbit meat consumption among students in Tizi-Ouzou University, Algeria. 12th world rabbit Congress, July 1-3 2020 – Nantes – France (Accepted).
- Kadi, S.A., M. Ouendi, C. Bannelier, M. Berchiche and T. Gidenne (2018). Nutritive value of sun-dried common reed (*Phragmites australis*) leaves, and its effect on performance and carcass characteristics of the growing rabbit. *World Rabbit Sci.*, 26:113-121.
- Lebas F. (2018). Performances moyennes des élevages cynicoles en France pour l'année 2017. Résultats RENACEB. *CUNICULTURE Magazine* Vol. 45. 22-26.
- Lopez M., H. Losada, R. Soriano, J. Vieyra and Y. L. Cortés (2000). Storing centres as a strategy for the commercialisation of rabbit's meat, in the Southeast of Mexico City. In 7th World rabbit Congress. Valencia, Spain, pp. 111-115.
- MADRP. (2017). Statistiques agricoles. Evolution des productions animales et végétales de 2011 2017. Direction des statistiques. Ministère de l'Agriculture, du Développement Rural et de la pêche.
- Mezali, L., D. Saidj and F. Mebkhou (2015). Production, commercialisation et consommation du lapin de chair en Algérie : Quelle place parmi d'autres filières viande. 15èmes Journées Sciences du Muscle et Technologies des Viandes - 4 et 5 novembre 2014 - Clermont-Ferrand.
- Mouhous, A., T. Benabdelaziz, C. Limani, S. A. Kadi, F. Djellal, H. Guermah and M. Berchiche (2019). L'efficacité des aides de l'Etat en relation avec les performances de production : cas des élevages cynicoles la région de Tizi-Ouzou. Algérie. 18èmes Journées de la Recherche Cunicole, 27 – 28 mai 2019, Nantes, France.
- Mouhous, A., H. Guermah, F. Djellal and S. A. Kadi (2020). Sustainability and profitability of commercial rabbitries in Tizi-Ouzou, Algeria. 12th world rabbit congress, July 1-3 2020 – Nantes – France (Accepted)
- Zerrouki, N, S. A. Kadi, M. Berchiche and G. Bolet (2005). Evaluation de la productivité des lapines d'une population locale algérienne, en station expérimentale et dans des élevages. 11èmes Journées de la Recherche Cunicole, Paris 29-30 novembre; 11-14.