

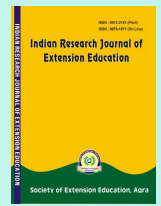


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Agricultural Advice and Decision-Making in the Management of Farms in the Main Dairy Basins of Algeria

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ABSTRACT

The study focuses on the involvement of extension services and agricultural advice in decision support for breeders, the Setif and Souk-Ahras dairy basins recognized by cereals, dairy cattle breeding and irrigated crops. A sample of 140 family farms was selected and surveyed between 2017 and 2018. The χ^2 test assessed the supply of advice and sources of information useful in the management farm. The use of the Kruskal-Wallis test demonstrated the level of influence of the agricultural council on the decision-making of breeders by sector of activity in relation to the choice of fodder crops, fertilization and treatment of fodder crops, increase in milk production, hygiene and disease control, sale of products and seeds, improvement of farm profitability, bookkeeping, information on subsidy programs and irrigation. Analysis of the Post Hoc ranking of our sample reveals 6 groups of breeders in terms of decision support.

Key words: Family farm; Cattle breeding; Agricultural extension advisor; Innovative project; Decision-making.

Supporting farmers in the construction of the decision or the decision support relates to very complex realities and to different and/or complementary research methods. In terms of farm management, clarifying the objectives of breeders is a concern of the agricultural extension advisor, during the discussions undertaken. It identifies the breeder's strategy, in order to adapt any improvements to real conditions and needs. It is important to clearly define the objectives in order to understand their implemented strategies. They will serve as selection criteria in the final decision to be made. They are the ones who will make it possible to choose between several possible projects, and to see if the selected project is likely to be carried out. So see if the decision is consistent with the objectives.

Our hypothesis postulates that among the factors which are at the origin of the change within the decision-making systems of the farmers-breeders, the support of the breeders and its origin constitute key elements and deserve to be analyzed in order to be

able to guide the technical advice and development policies. Indeed, through the understanding and analysis of the practices and objectives of breeders with the identification and analysis of their sources of information, more appropriate advice may be produced by the technical advisor and therefore relevant help to the decision.

To answer our hypothesis, we took the example of the dairy industry in Algeria in two potential dairy basins. We focused on the objectives of the breeders, the management tools adopted at the farms, the project ideas, the contribution of the agricultural extension advisor, the activities using advice and the sources of information useful for the day-to-day management of the farms; As well as the support of the agricultural council in the decision-making of the breeders. A series of nine (9) activities were selected for the purposes of the study, to stop those for which the breeders had used advice from outside the farm during the past three (3) agricultural seasons.

METHODOLOGY

The dairy basins are located in the heart of the high cereal plains of northeastern Algeria, with a semi-arid climate, which represents most of the dairy cattle farming territory. They bring together 52000 and 77000 dairy cows in Souk-Ahras and Setif respectively (MADR, 2016). The two basins are involved with 17 per cent in the collection of milk at the national level. They are distinguished by a diversity of production systems organized on subhumid bioclimatic stages in the north and semi-arid in the south. The agro-climatic conditions are quite similar. The combination of cereals and livestock is predominant in farms. The Holstein and Montbeliarde breeds are dominant at 74 per cent. Access to factors of production is comparable.

The study questionnaire is structured in two sections. The first section is intended for pastoralists and the second section is assigned to technical advisers from state extension services. The breeders' questionnaire includes four main areas: 1) Global information on the farm: structure, breeding and cultivation system, production equipment, technical data, relations with the environment; 2) Identification of the breeder; 3) Management profile of the breeder; 4) Use, appreciation and origin of agricultural advice in formal and informal extension on the innovations selected concerning the four main technical areas of breeding: feeding, reproduction, herd management, hygiene and prophylaxis.

Exploratory interviews with 10 farms, taken at random, were carried out in 2016 in order to test the questionnaire. The pre-survey allowed us to correct, amend and validate the study questionnaire.

The study was carried out between 2017 and 2018, through a survey, among a sample of 140 farms. The choice of farms selected on the following criteria: 1) Available farms of 6 dairy cows and more, with health approval, 2) The breeder's agreement to carry out the survey. The sampling method is systematic random: 1) The list of breeders to be surveyed is available, 2) They are chosen according to the number of people to be selected with a survey "step" of 5; 140 individuals were selected out of the 700 on the list. We sampled 68 farms in Sétif and 72 farms in Souk-Ahras. The sample is considered representative because all people had an equal chance of being selected. The managed

information is analyzed in the same database using the LeSphinxIQ22017Version7.3.2.3 and JASP2018 Version0.11.1.0 software. We used the χ^2 test to assess the supply of advice and information sources useful for farm management. We have demonstrated with the Kruskal-Wallis test the level of influence of the agricultural council on the decision-making of breeders by sector of activity chosen under study.

RESULTS AND DISCUSSION

The objectives of breeders and farm management tools: The results of the study show that the objectives of breeders are rarely linked (33%) to their ages. On the other hand, they are strongly influenced (91%) by the intention to maintain the profession of breeder and the source of income from dairy cattle breeding. Sometimes the goals are confused, vaguely expressed by breeders, and sometimes they are implied. Two categories of breeders appear. A 1st category, or 87 per cent, envisages maintaining the farm and passing on the profession to the descendants, with preparation for a succession for the majority. It is a matter of course between a family heritage and an assured succession. A 2nd category, 13 per cent, does not necessarily consider maintaining farm and does not intend to preserve the profession of breeder. This may imply that they are not specialized in dairy cattle breeding. And so, this is not a family heirloom.

We have identified management tools adopted at the farms level. Milk recording is 89 per cent the most adopted tool. It is carried out by breeders and collectors. The delivery of milk commits the farmer to controls of product quality parameters, which are taken care of by the collector. 31 per cent irrigated fodder cutting is practiced. In contrast, 24 per cent have a tool for feeding and rationing. Accounting, as a management tool that facilitates decision-making and provides a means of controlling ongoing achievements, is not adopted by 94 per cent of farms. The breeders are not taxable and according to their remarks, they carry out, themselves, calculations of production costs and profitability. Nevertheless, 69 per cent of breeders perceive accounting as a means of calculating production costs and is used in the choice of investments. Others (11%) find it useful in applying for loans or grants and 2 per cent say it is a vague concept to them.

Table 1. Correlation matrix of variables

| | PI | PO | CP AEA | C AEA | HD AEA | NC AEA | Decis | Mgt | MI1 | MI2 | MI3 |
|---|--------|-------|----------|----------|----------|----------|---------|-------|------|-----|-----|
| Project idea (PI) | – | | | | | | | | | | |
| Project's objectives (PO) | -0.01 | – | | | | | | | | | |
| Agricultural extension advisor AEA (CP AEA) | -0.14 | -0.01 | – | | | | | | | | |
| Consultation AEA (C AEA) | 0.22* | -0.01 | -0.95*** | – | | | | | | | |
| Help with the decision AEA (HD AEA) | 0.05 | 0.04 | -0.90*** | 0.87*** | – | | | | | | |
| No consultation AEA (NC AEA) | -0.08 | -0.02 | 0.57*** | -0.53*** | -0.51*** | – | | | | | |
| Decision-making (Decis) | -0.13 | 0.09 | 0.51*** | -0.50*** | -0.40*** | 0.20* | – | | | | |
| Management (Mgt) | -0.19* | 0.07 | 0.18* | -0.15 | -0.17* | 0.01 | 0.13 | – | | | |
| Management informations 1 (MI1) | -0.19 | 0.03 | -0.63*** | 0.58*** | 0.56*** | -0.48*** | -0.23** | – | – | | |
| Management informations 2 (MI2) | -0.19 | -0.04 | -0.04 | 0.04 | 0.09 | -0.11 | 0.01 | 0.08 | – | – | |
| Management informations 3 (MI3) | -0.19 | 0.06 | -0.42*** | 0.38*** | 0.44*** | -0.34*** | 0.04 | -0.09 | 0.05 | – | – |

CP: Consultation process *p<0.05, **p<0.01, ***p<0.001

The tactical and strategic decisions of breeders: Regarding strategic decisions, it appears that 57 per cent of breeders are themselves sources of innovative project ideas. Also, 16 per cent rely on family discussions or with associates. And 14 per cent are inspired by a neighbor or friend. The unanimity of the breeders, 87 per cent, did not feel any need at the agricultural extension advisor for a possible idea. This is indeed the heuristic behavior of our breeders who build their decisions on the basis of accumulated experience and discussions with environmental stakeholders (friendly breeders, neighbors, etc.). A result widely demonstrated and mentioned in the bibliography by several authors from the sixties to the two thousand.

The analysis of the Pearson correlation matrix (Table 1) makes it possible to understand and explain the links between the decision-making variables, with breeders, as follows: The agricultural extension advisor participates in 21.6 per cent in the idea of the project, for the breeders who consult it. The decision of this category is little influenced, that is 4.3 per cent, by the objectives of their project. The link between information on farm management and their choice of project is insignificant. The influence of this information on the decision of these breeders is around 36.4 per cent. The

correlation coefficient varies between 8.7, 44.2 and 56.4 per cent, is little significant.

For breeders who do not consult the agricultural extension advisor, the objectives of their project have little correlation with their decision-making. This means that decision-making among this category of breeders is little influenced, that is 8.6 per cent, by the objectives of their projects. Also, this category is not based on information related to farm management for the choice of their projects. They are based on unfixed objectives only and necessarily on the day-to-day management of dairy cattle in the farm. They have other special concerns and priorities in order to embark on a project for the future. The relationship is insignificant, that is 5.6 per cent, between decision-making and management information. The correlation coefficient varies between 0.1, 3.8 and 13 per cent, is not significant.

Activities requiring external advice : Regarding the management farm, research results show priorities for activities requiring advice from our breeders. The 1st position at 19.50 per cent goes to irrigation. Information on subsidy programs at 17.37 per cent, occupies the 2nd position. Bookkeeping placed in 3rd position with 16.22 per cent. Improved profitability of farm to 15.64 per

cent in 4th position. The sale of products and seeds in 5th position at 13.71 per cent. 6th position for hygiene and disease control with 12.16 per cent. The increase in milk production maintains 7th position at 3.67 per cent. Fertilization and treatment of fodder crops are in 8th position at 1.54 per cent. Finally, the choice of fodder crops ranked in 9th position at 0.19 per cent (Fig. 1&2).

The value (200.51) is greater than the critical value of chi-square for 8 degrees of freedom at the probability level 0.05 (15.51), therefore the H0 (no difference between breeders needing advice depending on their activity) is rejected ($p < 0.001$).

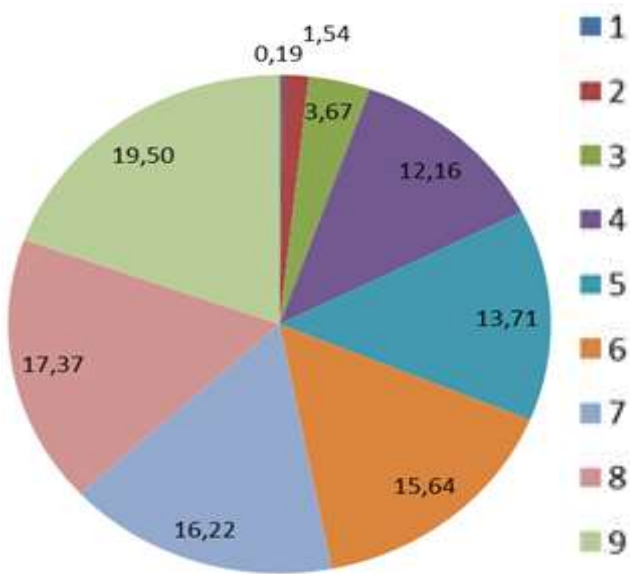


Fig. 1. Representation of the percentages of each activity

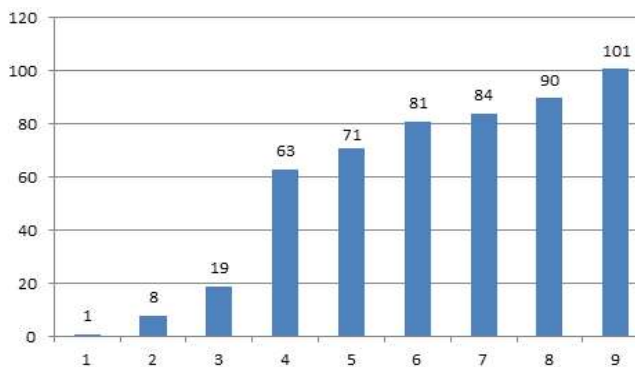


Fig. 2. Level of ranks considered in the analysis for each activity

Note : n = 1-101 for the corresponding activity as follows: 7. Bookkeeping; 5. The sale of products and seeds; 6. Improving the profitability of the operation; 2. Fertilization and treatment of fodder crops; 9. Irrigation; 1. The choice of fodder crops; 3. The increase in milk production; 4. Hygiene and disease control; 8. Information on grant programs.

The advice offer: With regard to management at the farm level, the research results reveal a diverse panoply of advice offers for the benefit of our breeders. The 1st position at 23.90 per cent, goes to various sources not necessarily cited by the breeders. The input suppliers (equipment, products, food, others) at 20.22 per cent, occupy the 2nd position for the offer of advice. The office of the breeders association placed in 3rd position with 17.65 per cent. The popularizer with 12.68 per cent in 4th position. The agricultural subdivision in 5th position at 12.13 per cent. 6th position for the chamber of agriculture with 8.46 per cent. The design office maintains the

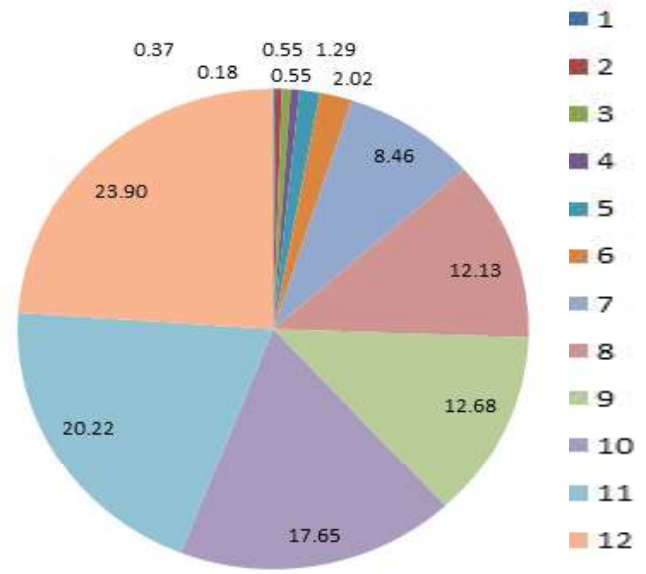


Fig. 3. Percentage representation of advice supply

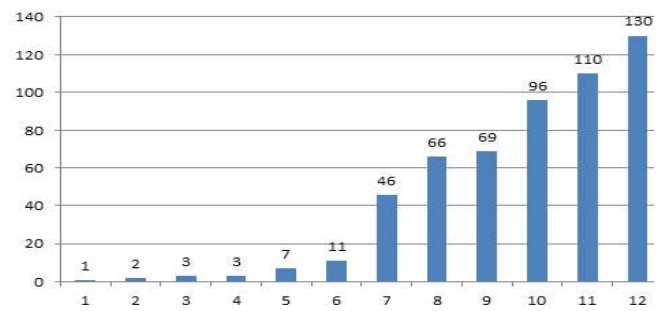


Fig. 4. Level of ranks considered in the analysis for providing advice

Note: n = 1-130 for the corresponding information source as follows: 12. Other; 11. Suppliers; 10. The office of the breeders association; 9. The popularizer; 8. The agricultural subdivision; 7. the chamber of agriculture; 6. The design office; 5. The veterinarian; 4. The CNIAAG artificial insemination center; 3. Technical institutes; 2. The research institute; 1. CNMA financial institutions.

7th position at 2.02 per cent. The veterinarian is in 8th position at 1.29 per cent.

The technical institutes and the artificial insemination center CNIAAG ranked 9th with 0.55 per cent. The research institute ranked 10th at 0.37 per cent. Finally, CNMA financial institutions placed 11th with 0.18 per cent (Figure 3 and 4).

The value χ^2 (551.04) is greater than the critical value of the Chi-square for 11 degrees of freedom at the probability level 0.05 (19.68), therefore the H0 (the sources of information contribute in the same

way to provide and providing answers to the needs of pastoralists) is rejected ($p < 0.001$).

Sources of information: In terms of management at the farm, the research results resulting from statistical analysis show that the information of our breeders in 1st position at a rate of 61.36 per cent comes from various sources. Input suppliers contribute 28.64 per cent of information provided to breeders, thus occupying the 2nd position. The fellow breeders placed in 3rd position at 9.55 per cent. Agricultural extension advisor in 4th position with 0.45 per cent (Figure 5 and 6).

The value χ^2 (191.56) is greater than the critical value of the Chi-square for 3 degrees of freedom at the probability level 0.05 (7.81), therefore the H0 (no difference in the utility of the source information) is rejected ($p < 0.001$).

The Post Hoc ranking of breeders: The Kruskal-Wallis test is a non-parametric method used to test whether samples originate from the same distribution. This test is interested in the medians of 'k' populations (k 3) (treatment) and proposes as a null hypothesis that the 'k' samples are confused and come from the same (combined) sample of a population. The test makes it possible to compare two or more independent samples of similar size or not.

We excluded eight (8) individuals from the study sample, excluded for lack of responses. Four farms in Souk-Ahras and four farms in Setif (Table 2).

| Table 2. Kruskal-Wallis Test | | | |
|------------------------------|-------------|----|--------|
| Factor | Statistic K | df | p |
| Activities | 131.465 | 8 | < .001 |

H0 = the degrees of influence in the decision-making attached to the 9 activities are not different.

H1 = the degrees of influence in the decision-making attached to the 9 activities are different.

Given that $K = 131.47$ and $p < 0.001$, we retain the hypothesis H1: the degrees of influence in the decision-making attached to the 9 activities are significantly different. The significant differences are marked in Table 3.

The Post Hoc group ranking provides information on the total number of groups distinguished in our study sample. The analysis reveals 6 group A, B, C, D, E and F, as well as activities whose technical advice strongly influences the decision for each group (Table 4).

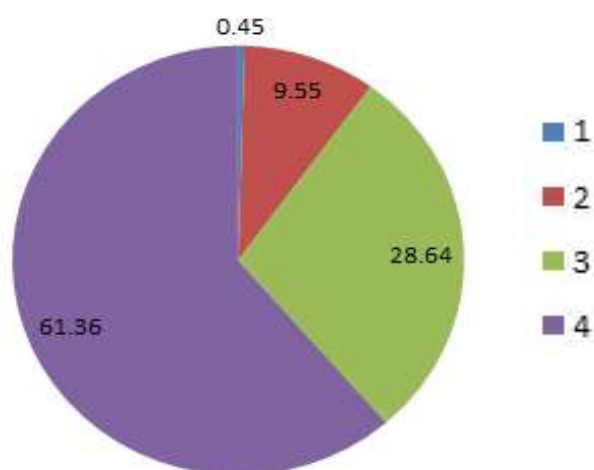


Fig. 5. Percentage representation of information sources

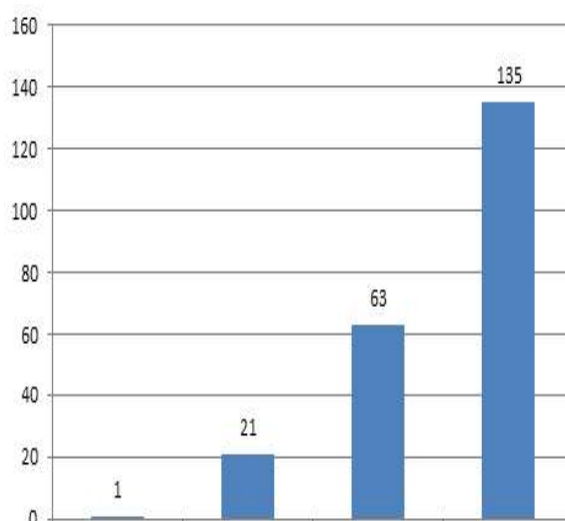


Fig. 6. Level of ranks considered in the analysis of information sources

Note : n = 1-135 for the corresponding most useful information source in management, as follows: 4. other; 1. that coming from the agricultural adviser of the local office; 3. that coming from suppliers and 2. that coming from other breeders.

Table 3. Dunn's Post Hoc comparisons activities

| Activities | Z | P _{bonf} |
|--|--------|-------------------|
| <i>Improved farm profitability</i> | | |
| Increased milk production | -1.575 | 1.000 |
| Choice of forage crops | -4.458 | < .001 |
| Fertilization and treatment of forage crops | -2.934 | 0.060 |
| Hygiene and disease control | 0.093 | 1.000 |
| Information on grant programs | 0.832 | 1.000 |
| Irrigation | 1.083 | 1.000 |
| Bookkeeping | 0.884 | 1.000 |
| Sale of products and seeds | -1.022 | 1.000 |
| <i>Increased milk production</i> | | |
| Choice of forage crops | -4.727 | < .001 |
| Fertilization and treatment of forage crops | -2.206 | 0.493 |
| Hygiene and disease control | 2.800 | 0.092 |
| Information on grant programs | 4.050 | < .001 |
| Irrigation | 4.217 | < .001 |
| Bookkeeping | 1.299 | 1.000 |
| Sale of products and seeds | -0.083 | 1.000 |
| <i>Choice of forage crops</i> | | |
| Fertilization and treatment of forage crops | 2.194 | 0.508 |
| Hygiene and disease control | 7.593 | < .001 |
| Information on grant programs | 8.855 | < .001 |
| Irrigation | 8.710 | < .001 |
| Bookkeeping | 2.031 | 0.761 |
| Sale of products and seeds | 1.904 | 1.000 |
| <i>Fertilization and treatment of forage crops</i> | | |
| Hygiene and disease control | 4.828 | < .001 |
| Information on grant programs | 5.989 | < .001 |
| Irrigation | 6.052 | < .001 |
| Bookkeeping | 1.662 | 1.000 |
| Sale of products and seeds | 0.898 | 1.000 |
| <i>Hygiene and disease control</i> | | |
| Information on grant programs | 1.261 | 1.000 |
| Irrigation | 1.617 | 1.000 |
| Bookkeeping | 0.879 | 1.000 |
| Sale of products and seeds | -1.232 | 1.000 |
| <i>Information on grant programs</i> | | |
| Irrigation | 0.445 | 1.000 |
| Bookkeeping | 0.694 | 1.000 |
| Sale of products and seeds | -1.738 | 1.000 |
| <i>Irrigation</i> | | |
| Bookkeeping | 0.623 | 1.000 |
| Sale of products and seeds | -1.905 | 1.000 |
| <i>Bookkeeping</i> | | |
| Sale of products and seeds | -1.261 | 1.000 |

Table 4. Post Hoc classification of homogeneous groups

| | | |
|---|-------------|-------|
| Improved farm profitability | A B | D E F |
| Increased milk production | A B | D E |
| Choice of forage crops | | C D |
| Fertilization and treatment of forage crops | A B C D | |
| Hygiene and disease control | A B | E F |
| Information on grant programs | A | E F |
| Irrigation | A | E F |
| Bookkeeping | A B C D E F | |
| Sale of products and seeds | A B C D E F | |

Group A includes the category of breeders whose decision-making is strongly influenced by the agricultural council for the choice of fodder crops.

Group B brings together the class of herders whose decision-making is strongly influenced by the agricultural council for the choice of forage crops, information on subsidy programs and irrigation.

Group C contains the stratum of breeders whose decision-making is strongly influenced by agricultural advice in improving farm profitability, increasing milk production, hygiene and disease control, as well as information on subsidy programs and irrigation.

Group D is the breeders whose decision-making is strongly influenced by agricultural advice on hygiene and disease control, information on subsidy programs and irrigation.

Group E constitutes the breeders whose decision-making is strongly influenced by the agricultural advice relating to the choice, fertilization and treatment of fodder crops.

Group F is the breeders strongly whose decision-making is strongly influenced by agricultural advice on increasing milk production, selection, fertilization and processing of fodder crops.

In agricultural advice, research results show a strong influence on the choice, fertilization and treatment of fodder crops. A moderate influence for the increase of milk production, the sale of products and seeds. Low efficiency in improving farm profitability, hygiene and disease control, information on subsidy programs, irrigation and bookkeeping (Table 5).

Table 5. Descriptive statistics

| Rang | Valid | Mis. | Med | Min | Max. |
|----------------------------------|-------|------|------|------|------|
| Improved operating profitability | 19 | 0 | 2.00 | 1.00 | 4.00 |
| Increased milk production | 84 | 0 | 3.00 | 1.00 | 4.00 |
| Choice of forage crops | 81 | 0 | 4.00 | 1.00 | 4.00 |
| Fertilization of forage crops | 63 | 0 | 4.00 | 1.00 | 4.00 |
| Hygiene and disease control | 91 | 0 | 2.00 | 1.00 | 4.00 |
| Information on grant programs | 93 | 0 | 1.00 | 1.00 | 4.00 |
| Irrigation | 71 | 0 | 1.00 | 1.00 | 4.00 |

Note: V=Valid, Mis=Missing, Med=Median, Min=Minimum, Max=Maximum

Analysis and discussion of results : The unanimity of the breeders, 87 per cent, did not feel any need at the agricultural extension advisor for a possible idea for a project or innovations. Breeders build their decisions on the basis of cumulative experience and discussions with environmental stakeholders (such as friendly breeders, neighbors, professional organizations and agricultural cooperatives). This is adaptive behavior that postulates consistency between the objectives of breeders and the means at their disposal. A result demonstrated and mentioned in the bibliography by several authors, such as, *Simon, Le Moigne, Landais, Deffontaines, Soler, Attonaty, Sebillotte, Boussard, Brossier, Bonneville, Jussiau, Chia, Marshall, Milleville, Petit, Faure et al.*, from the sixties until the two thousand years.

The reference to *Simon (1947)*, carried by *LeMoigne, (1977)*, served to understand the management choice procedures of farmers and their practices on the farms. In doing so, the gap with an objective of understanding the overall dynamics of the evolution of farms increases in this perspective of positioning within the limited rationality of actors concerned by a question declined at the individual level or local (*Attonaty et al., 2018*). This also applies to work on the economics and management of the farm, which has gradually refocused on the farmer, his objectives, his strategy, etc. (*Brossier et al., 1997*).

The work situation of *Pluvinage (2014)* in the 1990 on agriculture in semi-arid areas of Algeria, based on the work of *Sebillotte and Soller in 1990*, renewed

the link with the analysis of family farms in classic macroeconomic issues of agricultural economics by *Boussard (1987)*.

Tactical and strategic decisions to lead dairy cattle farming: Agriculture in many countries of the South is changing rapidly following strong demographic growth and rapid monetization of trade. The public authorities promote an intensification of agriculture through increased consumption of inputs or the spread of mechanization according to the model of the green revolution. On the other hand, even if the growth of production is marked, it remains unequal according to the regions of the country, and peasant practices are far from the recommendations of research and therefore limit, in the eyes of the supervisory structures, the output and the profitability of production (*Faure, 2012*). It is essential to distinguish the various practices of farmers, the rational coherences that manage them and the constraints of the actors for better support.

We approached the strategies of the breeders, by clarifying, according to their own perceptions of their environment, their objectives. With the current organization of the milk sector, milk production constitutes an opportunity because it has significant financial assistance, but also an innovation that some, depending on their degree of constraints, seize. Its adoption and development at the farm level induces choices, based on available resources, accumulated experience in the management of production factors and sources of financing (rotations, technical management of production, organization of work, or financing management). These choices have consequences for the performance of farm in terms of production and income. It is from this knowledge of farm taken as a whole, seen as a production system, that it is then possible to understand the decisions that govern the engagement in a project linked to the conduct of the dairy cattle breeding.

Nevertheless, the family unit contributes to the daily activities of the farm and to decision making. The participation of women is essential, but in decision-making, their help may be secondary. In India, despite the significant participation of women in agriculture, most of them fall into the middle category of decision-makers. They have been neglected when making decisions on various agricultural aspects. As the leader, the men in the family make the majority of the decisions

from the outset, of all farming activities. The women are less close than men to knowledge and skills, productive assets, including agricultural inputs, improved seeds, land, credit, agricultural extension services and small equipment / light machinery (Kavyashree *et al.*, 2021). Gautam *et al.*, (2012), affirm that in the family unit, on decisions relating to agriculture, women's suggestions are not taken into account; because the majority of women are illiterate, unfamiliar with new techniques and have limited mobility due to several cultural taboos. Short-term training in dairy practices would be useful for women to acquire the latest technical knowledge and skills in dairy production. But they have little time for training and extension programs. Projections for 2025 in India state that women will have skills in farm management and be able to make even complex decisions. In Tunisia, farm management is based on socio-economic conditions and farmers' know-how. Farmers are little affected by subsidiary activities linked to the primary sector. This type of activity only concern tasting days and participation in local festivals (Bouzaida *et al.*, 2019).

The place of dairy cattle farming on the farm: We were able to clarify how the farm works. In the first place, the objectification of the choices made by the breeders, allowed us to prioritize the objectives of the farm, namely: the improvement of income, which is a crucial concern, the preparation of the farm for the next generation and the improvement of working conditions, as well as the acquisition of the essential means allowing an increase in output. Dairy cattle's breeding generates significant income for breeders. It also provides a permanent financial income over time, fairly regular, allocated primarily for the daily consumption needs of the family, and then to cover production costs. First, it ensures the autonomy of daily financial cash flow at the family level by maintaining a balance with crops whose sales are more seasonal.

It appears clearly from our investigations that the objectives of the breeders focus primarily on increasing income, preparing for succession and improving the yields of dairy farming. Family members take care of milking and sample collection for milk quality control. Agricultural cooperatives play a very important role in milk recording. The intervention of the agricultural

cooperatives lies in the support of member breeders, on a daily basis, in the collection of milk. Agreements are signed between the agricultural cooperatives and the milk collectors produced at the farm. Our breeders are all members of the Wilaya Chamber of Agriculture however; it marks a validated absence in terms of supervision. In addition, accounting, which is an essential management tool for farm, is adopted in a minority. The participation of technical and financial institutions, supposed to facilitate the development and use of the tool, is insignificant.

The mistrust of the majority of our breeders constitutes a constraining obstacle for the consultation of the technician, in this case the agricultural extension advisor. This loss of confidence is expressed by the idea that the state subsidizes a project only to make a profit. Also, the proposed subsidy programs are not well thought out and rarely take into consideration the real needs of breeders. They have their perceptions, behaviors, procedures and approaches. For this category, the family nucleus constitutes a center of strategic and tactical decisions. The age and seniority in the profession of these breeders are two determining factors for not using agricultural extension advisor.

Confidence for a minority of our breeders constitutes a motivating assurance in consulting the agricultural extension advisor. He is in demand as a state representative at the local level. It is a source of information on grant programs. Thus, he perceived as a facilitator of administrative procedures. This recourse consists in specifying the nature of the assistance, in founding, in approving and in validating their projects.

The life cycle and trajectories of the farm: The current situation of our farms does not allow us to sufficiently inform us about the objectives of the breeders. The history of these is not well enough known and we cannot clearly determine their life cycles and trajectories. Nevertheless, they seem to be in a phase of transition and growth.

Innovation, a social framework, intimately linked to the decision-making process: Several authors stress that innovation is strongly linked to the decision-making process. All decisions, and especially those of a strategic nature, generate changes and many of these changes can be understood as innovations including a technical and

organizational dimension at the farm level.

In fact, getting involved in a project, a decision that is prepared and built over time, requires multi-year planning of its funding, involves a reorganization of work, and induces changes in the management of livestock and cropping systems. It therefore corresponds to a new strategic direction, which has implications for the whole family. The family's project concerning farms is well supported by these members, but weakly supported by technical and financial institutions. Funding is rarely given to our breeders for a future project. On the other hand, project ideas commonly spring from the family nucleus. They hope to earn more money for a better standard of living and a secure future for the family inheritance.

Our results show that our breeders embarked on a project for the future, in the absence of support from agricultural extension, difficult access to financing and a sector that does not contribute to reducing the level of risk. Piloting of the far: Our breeders have great difficulty in predicting the future and projecting themselves into the future, mainly for farms with little room for maneuver due to insufficient agricultural land, labor force and funding. The words of our breeders clearly relate these constraints. Sometimes by making forecasts it is still a risk to expose their productions, by attracting 'bad luck', according to them.

The breeder manages several workshops independently and their consistency, in view of his strategy, is achieved by defining the constraints perceived and identified by the breeder. Planning does not happen on a program of action. The management of workshops and constraints are considered as benchmarks.

Constraints and workshops: The breeders consider that a few workshops are therefore protected priority. Decisions will be little affected by changes in the environment. A high level of constraints requires the breeder to modify the management implemented. We can think of food and financial security at the farm level, when it comes to cereals, market gardening and dairy cattle breeding. Other workshops serve as a buffer, such as calf rearing and sheep rearing (fattening). They allow the necessary adaptations to mitigate disturbances and delimit risks. In Algeria, women constitute the family

nucleus and play a crucial role in food security. *Gautam et al., (2012)*, claim that women are responsible for generating food security (production, access and use) for their families in many developing countries, especially in India; they are actively involved in all agricultural activities except plowing. The women are essential contributors to agricultural and rural economies around the world. But, the extent and nature of its contribution are often difficult to assess and vary from country to country. However, they still remain invisible workers. They are often engaged in milk and farm animal tasks. They spend more time in milk production operations than men. A study in the Krishna district of Andhra Pradesh found that the majority of women participate in decision-making on the economics of the dairy farm (*Leela Krishna et al., 2022*).

CONCLUSION

The needs of breeders for agricultural support and advice are based on their objectives, means and constraints encountered. They are different between a small farm, having difficulty in ensuring its food self-sufficiency, and an average or potential farm. These needs translate into diverse requests for farm counseling. Particular interest is given to the counseling process at farm. We have tried to accurately deal with the breeder's strategy and decision-making processes at farm level. The current situation of farms does not allow us to sufficiently inform us about the objectives of the breeders. The evolution of the past of farms is not well enough known and we cannot clearly determine the life cycle and adaptation trajectories of these to maintain their productions and cope with intra and extra farm constraints. The renewal of advice methods makes it possible to respond to the concerns of breeders. It would therefore be appropriate to overhaul the agricultural extension and advisory system, which is unable to meet the expectations of stakeholders. This will help to identify more effective public policies for the development of these farms. The overhaul of this system will be the subject of a future publication.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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