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OBSTACLES TO THE ADOPTION OF IMPROVED RABBIT TECHNOLOGIES BY SMALL SCALE FARMERS IN NSUKKA LOCAL GOVERNMENT AREA OF ENUGU STATE

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ABSTRACT

The study was designed to identify the obstacles to the adoption of improved rabbit technologies by small- scale farmers in Nsukka Local Government Area of Enugu State. A structured interview schedule was utilized in obtaining information from sixty respondents. Data were analysed using percentages, multiple regression and factor analysis. The study revealed that young children of school age (63.3%) and mostly males (93%) dominate in the production of rabbits. Age (t = -2.24), education (t = 2.09) and years of experience (t = 2.02) were significant in influencing the adoption of improved rabbit technologies. The major obstacles to the adoption of improved rabbit technologies were; 'management and economic constraints and nutritional and housing constraints'. It was concluded that efforts should be made by extension agents to design programmes aimed at co-opting students in secondary schools towards achieving a mass adoption of improved rabbit technologies. This will lead to the achievement of a multiplier effect in the adoption of the technologies, which undoubtedly will increase production, and subsequently the protein intake in the society.

Keywords: Rabbit technologies, Small scale farmers, Nsukka Local Government Area, Enugu State

INTRODUCTION

Animal protein is very essential for the growth, development and maintenance of human life especially because it contains all the essential amino acids needed for this purpose. Shortage of protein, particularly those of animal origin is prevalent in most parts of Africa where it is estimated that on the average, 10g of animal protein is consumed per day compared to a recommended daily intake of 35g (FAO, 1986). Obioha (1992) observed that the level of consumption of meat and animal protein in Nigeria is estimated at about 8g per caput per day, about 20g less than the minimum requirement by the National Research Council of the United States of America.

In order to ensure adequate supply of protein to the rapidly growing population of Nigeria, the output of animal products has to be increased especially by short cycle animals such as rabbits, poultry and pigs (Ozor and Madukwe, 2001). Unfortunately, poultry and pigs require food sources, which are in direct competition with man while rabbits can be produced from the enormous forages and feed materials that freely abound in the tropics (Aduku *et al.,* 1990; Biobaku, 1993). Aduku *et al.* (1990) maintained that rabbit production has enormous benefits among which include; its high adaptability, easiness to manage, high growth rate, very high prolificacy and fecundity levels, its return for money, high quality meat products, its use for laboratory purposes, and pets and the highly soil enriching manure. The high prices of beef, chevon, mutton, chicken and even frozen fish is a good point for rabbit meat which is not only cheap to produce but saves cost of refrigeration as its meat is supplied in piece meal suitable for a family's need or a small party (Ajala, 1989; Aduku *et al.*, 1990).

Nigeria can boast of 13 million cattle, 34.5 million goats, 22.1 million sheep, 1.7 million rabbits and 0.5 million guinea pigs (FDL, 1992). These figures reveal that the population of rabbits is so poor when compared with other livestock in the country. According to the Presidential Taskforce on Alternative Formulation of Livestock Feeds (1992), rabbits are still the least populated livestock animal kept in the country when compared with other livestock animals. This poor population figure must be as a result of numerous constraints, which hinder its adoption and its subsequent production to augment the protein intake in our diets.

The study was therefore designed to find out in detail, the major obstacles to the adoption of improved rabbit technologies by small-scale farmers in Nsukka local government area of Enugu State. Specifically, the study was designed to:

1. identify the socio-economic characteristics of the rabbit producers;
2. investigate the relationship between the socio-economic characteristics of the respondents and adoption of improved rabbit technologies;
3. identify the major obstacles encountered by rabbit producers; and
4. draw implications for livestock extension, policy and practice.

METHODOLOGY

The study area was Nsukka Local Government Area of Enugu State. It comprises twelve autonomous communities – Ibagwa, Okutu, Okpuje, Obukpa, Edem, Obimo, Lejja, Ede-Oballa, Nsukka, Ehalumona, Opi, and Umabo - from where five communities (Edem, Ede-Oballa, Ibagwa, Nsukka and Obukpa) were purposively selected based on the large number of rabbit farmers in the communities and also their accessibility. In each of these communities, farmers were clustered from where ten farmers each were randomly selected and interviewed except Nsukka urban where for easy access twenty farmers were selected. This brought the total number of respondents to 60 rabbit farmers.

A structured interview schedule was used in obtaining relevant information from the respondents. The

Variables considered under the personal characteristics of the respondents included: age, gender, educational level, years of rabbit keeping experience, stock size, household size and membership of social organizations. A three point Likert type scale was developed and used to determine the extent to which the constraint factors listed posed a hindrance or obstacle to the adoption of improved rabbit technologies. The response options and values assigned were as follows:

Not a Problem (NP) = 0; Little Problem (LP) = 1; Much Problem (MP) = 2.

Six major constraint variables in rabbit production identified by Aduku *et. al*. (1990), Livestock Echo (1997) and Ozor (1998) were adapted and used for the study. However, specific issues bordering on each major constraint item were investigated and their grand mean was used to represent the major item. A varimax rotated factor matrix was then employed to identify the most important obstacles to the adoption of this technology. In order to ascertain the level of adoption by the respondents, technologies from the production recommendations on improved rabbit production practices from Enugu State Agricultural Development Programme (ENADEP) were adapted. Adoption scores were calculated by using seven stages of adoption that were rated as follows: unaware = 0, aware = 1, interested = 2, evaluation = 3, trial = 4, adoption = 5, and discontinuance = 0.

Data collected on socioeconomic characteristics were analyzed using percentages while factor analysis was employed in analyzing the major obstacles that hindered the adoption of improved rabbit technologies. A multiple regression analysis was employed in ascertaining the relationship between adoption of innovations (dependent variable) and socioeconomic characteristics of respondents (independent variable) represented by the equation: $Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + e$; where Y = adoption, a = intercept, b_1-b_6= regression coefficients, x_1 = age, x_2 = education, x_3 = household size, x_4 = membership of social organization, x_5 = years of rabbit farming experience, x_6 = stock size and e = error term.

RESULTS AND DISCUSSION

Socio-Economic Characteristics: The study showed that majority (93.0%) of the respondents were males showing that extension programmes for improved rabbit production favour mostly males (Table 1). Majority (63.3%) of the respondents were aged between 11 – 20 years. Majority (56.7%) were yet to complete secondary education. The implication of this is that young people who are still in secondary schools dominated rabbit production in the study area. Agricultural extension programmes on rabbitry can therefore be directed to such people and this could be enhanced through the formation of Young Farmers' Clubs (YFCs) or Livestock Clubs in such schools where agricultural innovations can be taught to them for a multiplier effect. Majority (96.7%) of the respondents had formal education while 75.1% of them were still in school. This stresses the role of education in increasing the adoption of improved agricultural technologies as was observed by Madukwe (1995) who isolated educational levels of farmers as one of the variables related to adoption of improved farm practices.

Also, 65.0% of the respondents had between 1 – 5 years of rabbit keeping experience. This shows that rabbit rearing was recently introduced in the area especially when compared with other livestock like poultry, sheep and goats. The study further showed that a majority (43.3%) of the respondents kept 1 – 5 rabbits thus confirming that rabbit rearing was still a new innovation kept at subsistent level. Data in Table 1 also indicate that majority (60.0%) of the respondents had a household size of between 5 – 9 depicting the large number of 'mouths' fed per household. Also majority (58.4%) belonged to one or two social organizations in the area. Onu (1991) noted that social organizations serve as a forum through which farmers could exchange ideas and learn about new farm practices. Such exchange of ideas about new farm practices can take place in cooperative unions and Young Farmers' Clubs etc.

Table 1: Percentage distribution of respondents according to their socio-economic characteristics (n = 60)

Variables	Percentage (%)
Gender	
Male	93.0
Female	7.0
Age	
≤ 10 years	6.7
11 – 20 years	63.3
21 – 30 years	13.3
31 – 40 years	10.0
41 – 50 years	6.7
Educational level	
No formal education	3.3
Primary school incomplete	11.7
Primary school complete	13.3
Secondary school incomplete	56.7
Secondary school complete	8.3
Post secondary education	6.7
Years of Rabbit Keeping Experience	
1 – 5 years	65.0
6 – 10 years	26.7
11 – 15 years	8.3
Stock Size	
1 – 5	43.3
6 – 10	31.7
11 – 15	15.0
≥ 16	10.0
Household Size	
1 – 4	40.0
5 – 9	60.0
Membership of Social Organizations	
None	28.3
1 – 2	58.4
3 – 4	13.3

Relationship between the Socio-Economic Characteristics of Respondents and Adoption of Improved Rabbit Technologies: Data in Table 2 show the multiple regression result of the relationship between the socio-economic characteristics of respondents (age, education, household size, membership of social organization, years of experiences, and stock size) and adoption scores on improved rabbit technologies. The result shows that three independent variables – age (t = -2.24), education (t = 2.09), and years of experience (t = 2.02) were significant in explaining 25 per cent of the variation in adoption. The estimated value of adoption (Y) is shown as follows: Adoption (Y) = $3.91 – 0.02x_1 + 0.06x_2 + 0.02x_3 + 0.23x_4 + 0.08x_5 – 0.02x_6$

That age was correlated with adoption in this study is not surprising because previous studies by Igbokwe (1984), Okoro (1991), and Ajala (1992) had reported a relationship between age and adoption of technologies. This finding showed that young people of

school age kept more rabbits probably because of the peculiar interest they had in the animal and the 'pocket money' they were obtaining from the sale of the animal or its products.

Another significant variable in this study was education. Young people who were still in secondary schools had the highest percentage level of education and this showed that the children obtained a lot of knowledge and experience on rabbitry informally from their fellow friends in the school and formally from the school curriculum.

Table 2: Multiple regression analysis on the relationship between socio-economic variables and adoption of improved rabbit technologies

Independent variables	Coefficient	T-value	F-ratio	R^2 (adj)
Constant	3.91 (0.35)	11.34*	3.01	0.25
Age	-0.02 (0.01)	-2.24*		
Education	0.06 (0.03)	2.09*		
Household size	0.02 (0.04)	0.70		
Membership of social organizations	0.23 (0.11)	2.08		
Years of experience	0.08 (0.04)	2.02*		
Herd size	-0.02 (0.02)	-0.97		

*Values in parenthesis are standard errors; * $P \leq 0.05$*

The finding is in consonance with previous studies by Okoro (1991) and Ajala (1992), which revealed that there was a significant and positive relationship between education and adoption. According to Onu (1991), education enhances behavioral change (knowledge, skill, attitude and aspiration) because it informs and leads to the understanding of complex materials and value and use of innovations.

Also, the years of experience in rabbit farming showed a positive relationship with adoption of rabbit technologies. This finding is in agreement with the previous study by Najafi (1979) who observed that years of farming experience was positively correlated with the adoption of innovations. Therefore, the older a farmer is in keeping rabbits, the more he adopts new information or innovations on rabbitry. On the other hand, the items that were not significant in influencing adoption of this study were; household size, membership of social organizations and stock size.

Major Obstacles to the Adoption of Improved Rabbit Technologies: Data in Table 3 show the constraint factors to the adoption of improved rabbit technologies by small-scale farmers in the study area.

Table 3: Major obstacles to the adoption of improved rabbit technologies

	Constraints variables	Factor 1 "Management and economic constraints"	Factor 2 "Nutritional and housing constraints"
1.	**Breeds and Breeding**	0.82*	-0.01
2.	**Feeds and Feeding**	0.13	-0.73
3.	**Housing**	0.22	0.71
4.	**Routine management operations**	0.78	0.36
5.	**Marketing**	0.85	-0.07
6.	**Health care**	0.79	0.06

** Varimax rotated factor matrix*

Based on the item loadings, factor 1 was named "management and economic constraints" while factor 2 was named "nutritional and housing constraints". Thus the two factors represent the major obstacles encountered by rabbit farmers in the study area.

This finding is in agreement with the finding by Livestock Echo (1997) which pointed out that among the major constraints to successful commercial rabbit keeping in the tropics were problems of inadequate nutrition, poor management and reproduction techniques, shortage of pure breeding stocks, housing and marketing problems.

Poor management and economic constraint is the inability of the rabbit farmers to embark on series of activities and techniques that will lead to high profitability and which provides the enabling environment for an increased standard of living. Specific items aggravating poor management and economic constraints in the adoption of improved rabbit technologies include; marketing constraints (0.85), breeds and breeding constraints (0.82), healthcare constraints (0.79) and routine management operation constraints (0.78).

The marketing problems were derived from the difficulty in transporting rabbits to the markets, poor acceptability of rabbit meat, low prices of rabbit meat and its products and minimum sources of ready markets for rabbits and its products. Livestock Echo (1997) noted that marketing channels for rabbit meat is badly developed in Nigeria. This, it further observed derives from the fact that, like in most other consumer countries, rabbit meat is not well known and therefore no special taste has been developed. In fact in some circles, rabbit meat has to be ridiculously priced before it can attract buyers or it is rejected outright for social reasons of lack of familiarity. The breeds and breeding problems included difficulties in the identification and purchase of good breeding stock, lack of adequate knowledge of proper age of breeding animals, difficulty in determination of pregnancy and the problem of identifying signs of approaching parturition. Healthcare problems included the difficulty of rabbit producers to procure specific drugs for specific treatments of rabbit illnesses, inability to promptly isolate sick animals and difficulty of access to veterinary services. The routine management operation problems encountered by rabbit farmers were; problems in handling and restraining animals, care of young litters, fostering young rabbits, weaning of litters, determination of sex, cost of stocks and other materials for rearing rabbits, labour required in taking care of rabbits and the stress involved in record keeping.

The other constraining factor in the adoption of improved rabbit technologies by small-scale farmers in the study area was "nutritional and housing constraints". Food and shelter comprise the basic necessity of life. Nutritional and housing constraint factors in rabbit production were mostly due to seasonal change – rainy and dry seasons. Enough succulent feed materials were always available for the animals during the rainy periods while dry season periods are characterized by scarcity of herbage or forages for the animals. Housing animals especially in hutches were costly with its accompanying maintenance and repairs.

Some specific issues, which amplify nutritional and housing constraints in adopting rabbit technologies, include; feeds and feeding problems (-0.73) and housing constraints (0.71). Feeds and feeding problems encountered by the rabbit producers were; difficulties in cutting grasses, hay making, collecting roots, procuring grains, leaves and other feed materials. Others were problems in the supply of concentrate feeds, problems in identifying rabbit feeds, lack of knowledge of the proper

quantity of feeds to give to animals, difficulty in feeding the animals during dry season periods and poor feed storage systems. Inadequate fibre nutrition leads to digestive problems characterized by diarrhoea and subsequent inefficiencies in the utilization of feed resources. Inadequate energy, protein or micronutrient levels in the diet may impair reproduction of rabbits (Livestock Echo, 1997). In the same vein, the rabbit farmers remarked that housing problems ranged from high cost of building materials for constructing the cages, repair works on the hutches, including roofing sheets to the problem of unavailability of land needed for building the rabbit houses. Some of the respondents having between 1 – 5 numbers of rabbit, attributed such a small herd size to inadequate accommodation which has prevented them from expanding their herd size. Writing on housing problems, Livestock Echo (1997) noted that special consideration must be given to the choice of hutch materials for rabbit keeping stressing on the attribute of rabbits to gnaw at any cage materials used to house them.

Conclusion: This study examined the obstacles to the adoption of improved rabbit technologies by small-scale farmers in Nsukka Local Government Area of Enugu State. It observed that majority of the rabbit farmers were males and fall between the age ranges of 11 – 20 years. Majority of them were still in school (secondary school students) and had 1 – 5 years of experience in rabbit farming. The study further revealed that majority of the rabbit producers kept only 1 – 5 rabbits, had a household size of between 5 – 9 and equally belonged to one or two social organizations in the area.

The relationship between the socio-economic characteristics of respondents and adoption of improved rabbit technologies showed that age, education and years of farming experience were significant. The study further showed that the major obstacles to the adoption of improved rabbit technologies in the study area were; "management and economic constraints" and "nutritional and housing constraints".

In the light of the major findings of this study, the following recommendations are advanced as a panacea to the obstacles encountered by small-scale rabbit farmers in Nsukka Local Government Area. There should be effective co-operation or linkage between the secondary school system and agricultural extension programmes especially as it concerns the rabbit production because most of the rabbit farmers were still in secondary schools. In this case, the extension agents should endeavour to organize the pupils into Young Farmers' Clubs (YFCs) with the assistance of the agriculture teacher. These efforts should be directed mostly towards the male folks to achieve higher results.

In order to surmount the obstacles ("management and economic constraints" and "nutritional and housing constraints"), to the adoption of improved rabbit technologies by these farmers, efforts should be made by extension workers to organize training programmes directed toward rabbit improvement. Seminars, workshops and agric. show on improved rabbit production and management practices should be organized for the rabbit producers. This undoubtedly will improve on their knowledge, skills and techniques in rabbit production which will lead to increased production of the animal (rabbits) and subsequently lead to a higher protein intake from rabbit meats and hence a better and improved health status.

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