

*Full Length Research Paper*

# None conventional storage and handling methods of egg practiced in East Wollega, Ethiopia

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To know and identify the traditional practices of egg storage methods, a survey work was conducted in the east wollega zone of Ethiopia. The survey was carried out with a stratified sampling technique and using a structured questionnaire. A total of 315 households (225 from rural and 90 from urban) from five peasant Associations (PA) and 45 households owning chickens were selected from each PAs and selected town dwellers for interview and generate relevant information on the traditional egg storage and associated traditional practices in the region. The collected data were described using descriptive statistics. Five most common egg storage containers and five storage durations were identified through a preliminary survey carried out in the rural and urban areas of East Wollega. These storage methods include cartons, polyethen bags, baskets, clay pots and teff grain. The result further indicated that depending on the availability of the storage materials in the locality, 87 percent of the urban households (n=90) store eggs in cartons and polyethene bags in order of availability. Seventy nine percent of the rural households (n=225) ranked teff as the most common storage materials used followed by the basket and clay pots. The survey has indicated that the pre-incubation storage period takes 12 days on average with the range of 4 to 20 days. The storage for pre-marketing period of eggs ranged between one to three weeks with an average of 14 days. However, all the storage methods requires further research consideration for a through evaluation of each the methods for optimum unitization of best alternative traditional storage methods.

**Key words:** Traditional egg storage Methods, egg storage duration, egg handling, egg selection, Eastern Wellega.

## INTRODUCTION

The majority of poultry in Ethiopia are raised under traditional system of production. These birds contribute eggs for hatch and consumption (market). Alemu (1995) stated that collecting agents gather together larger numbers of eggs for sale in markets of larger towns and cities; and where distances to markets are long, there is marked deterioration of egg quality. This may be due to the different storage methods practiced by farmers since eggs decline in quality and hatchability very easily from the time of laying (Alamargot 1987).

This being the fact, there are different storage methods practiced under rural and urban conditions depending on the availability of materials in the locality. After surveying

of the rural poultry production system in the central high lands of Ethiopia, Tadelle (1996) reported that materials for setting eggs are either clay pots, cartoons, bamboo baskets, or even depression made in the ground; with Teff and barely straw are used for bedding material in all systems. These various factors related to storage methods can affect the hatchability and quality of eggs during storage (Alamargot, 1987).

In countries like Ethiopia, where the majority of poultry production is based on extensive rural production systems research has to give more focus on improving the existing technology by making use of locally available materials through properly assessing the different production systems (Tadelle, 1996).

The objective of the preliminary survey was to identify the most common egg storage methods and materials used in the study area and test some of the most common practices there by to develop some simple techniques which may possibly minimize such quality and

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**Table 1.** Some most common egg storage containers identified by the surveyed urban and rural households of East Wollega (number and percent).

Container	Rank	Urban		Rural	
		No	%	No	%
Baskets	1	5	5.6	74	32.9
	2	14	15.6	94	41.8
	3	20	22.2	66	29.3
	4	33	36.7	54	24
	5	39	43.3	60	26.7
Clay pots	1	5	5.6	43	19.1
	2	10	11.1	52	23.1
	3	15	16.7	77	34.2
	4	17	18.9	50	22.2
	5	21	23.3	57	25.3
Teff grain	1	3	3.3	108	48
	2	11	12.2	70	31.1
	3	12	13.3	64	20.4
	4	18	20.0	40	17.8
	5	13	14.4	40	17.8
Cartons	1	42	46.7	-	-
	2	32	35.6	9	4
	3	23	25.6	21	9.3
	4	11	12.2	45	20
	5	10	11.1	44	19.6
Polythene	1	37	41.1	-	-
	2	23	25.6	-	-
	3	20	22.2	15	6.7
	4	11	12.2	36	16
	5	7	7.8	24	10.7

hatchability losses.

## METHODS

A formal survey with stratified sampling technique was applied for survey data collection. Based on the data available from the zonal MOA office and the discussion made with the respective staff all the peasant associations (PAs) and towns in the zone were categorized into one of the agro ecologies Vs (high, medium or low) altitude.

Five PAs and two towns were randomly selected from each of the agro-ecologies.

Then, 45 households who currently own poultry were randomly selected from each of the selected peasant associations and towns and subjected to the structured questionnaires. A total of 315 households (225 from rural and 90 from urban) were included in the survey. Information on egg storage practices were collected and described.

The surveyed households were asked to tell the types of materials they use for storing the eggs, the number of

days (duration) of storing eggs before setting and/or marketing or consumption, the average number of eggs set, etc. Descriptive statistics was used for analysis of the survey data.

## RESULTS AND DISCUSSION

### Egg storage containers

The result of this preliminary survey presented in table 1. The result indicates that materials used for storing eggs depend on the availability of the materials in the locality. 87.8 percent of the urban households (n=90) store eggs in cartons and polythene bags in order of availability. Wood shaving (saw dust) is mainly used as bedding material when eggs are stored in cartons.

Seventy nine per cent of the rural households (n=225) ranked Teff grain as most common materials used for storing eggs followed by baskets and clay pot. The reason for preferring Teff than other grains might be that Teff can maintain lower temperatures even during hot periods; it is less susceptible to storage pests such as

**Table 2.** Some egg handling practices by the surveyed households in the rural and urban areas of East Wollega (number and percentage).

Practice	Rural		Urban		Overall	
	No	%	No	%	No	%
Collection of eggs after lay	103	45.78	43	47.78	146	46.4
Position of eggs at storage	-	-	-	-	-	-
Cleaning of eggs	69	39.4	28	39.4	97	39.4
Selection of eggs for setting medium to large size	148	74	46	69.7	194	73
Set market eggs for incubation	78	34.67	68	75.56	146	46.3
Set eggs of one hen under the other	161	71.6	55	61.11	216	68.6

weevils (personal observation). Moreover, keeping the eggs in grain than other materials may minimize the risk of breakage.

In rural conditions cereal straw usually Teff straw is used as bedding material in different containers. Tadelle (1996) also reported the use of straw bedding under all conditions of egg storage in the central highlands. Though not common, other materials used as bedding include coffee hulls, shavings, dried grass, and straws of different crops Kitalyi (1996). 85.7 percent (n=315) of the respondents prepare laying nest (laying place) when a bird is ready to start lay. In most of the cases the households place the nests at darker places near the corners of the room. The covering of the containers in which the eggs are kept depends on the prevalence of predators.

### Egg Handling Practices

Some egg handling practices by the surveyed households in the rural and urban areas of East Wollega (number and percentage) is given in table 2. Accordingly, 46.4 per cent of the surveyed households collect the eggs immediately after lay; the remaining respondents leave the eggs at the places where they are laid and incubate there. The reason of collection is to avoid mechanical damage and predator losses.

Almost all respondents have never observed the position of eggs at storage. But position of egg during storage has effects on the quality and hatchability of eggs. Proud foot (1967) evidenced that packing eggs with the small end up and storing in the upright position, with out turning, results in improved embryo survival at all stages of storage time.

The respondents were asked whether they perform any mechanism of cleaning the physically dirty eggs. Accordingly, 39.4 per cent (n=245) clean the physically dirty eggs by rubbing the surface with cloths soaked in water. The purpose of cleaning is to attract the market. The main cause of dirtiness of eggs is the mud that

comes in with the hen when she comes from scavenging. Some households provide only solid feeds like grains for the laying and incubating hens with the intention of avoiding fluidish waste/manure, which is a major source of dirtiness (personal observation).

Seventy three per cent of the surveyed households (n=266) were found to select larger and medium sized eggs for incubation and use small sized eggs for home consumption or market. 46.3 per cent of the households set eggs purchased from local markets and 68.6 per cent of the respondents were found to set eggs of one hen under the other. This point can be explained in terms of lengthening the productive life of the bird by reducing the time spent for incubation and brooding. According to smith (1990) incubation and brooding phases constitute 21 and 56 days respectively under scavenging conditions.

To break up the broody behavior of the hen, the traditional method (similar to the report of Tadelle, 1996) used by the households in the study area is by piercing the nostrils with feather and hanging the bird up side down for 3-4 days for a limited period of time each day.

### Pre-Incubation/Marketing Storage Duration

The results of the survey indicate that over all average pre-incubation storage duration was 12 days with ranges of 4 to 20 days. About 81% of the respondents fall within this range. On the other hand the pre-marketing/consumption storage period of eggs ranged between one to three weeks with overall average of 14 days.

### CONCLUSION

From the result of this study one can conclude that there are a number of egg storage methods, egg storage duration and handling of eggs that would influence egg quality before final utilization of eggs require further investigation for evaluation and recommendation of the best methods of eggs storage and handling practices.

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