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BACTERIOLOGICAL QUALITY OF RAW EYES (Gohara)

By

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INTRODUCTION

Nowadays, the meat industry more than ever before looks to the meat producing animal from two points of view. The first is the value of the lean meat and the other is the "by-product credit" of the other edible and inedible products.

Offals are among the edible by-products, and are highly demanded because of their low price, agreable taste and considerable nutritive value.

Head meat is one of the offals derived from the major meat animals, they are either offered as a sort of food or they are used comminuted as ingredients in some processed meat products. (Gerrard, 1977; Swingler, 1982 and Harry and William, 1986).

As livestock are salughtered mainly for their meat; low attention is given to the offals particularly heads because they incised for detection of cysticerci and low attention paied to them as a source of contamination because of mishandling of them as trailing on the floors and dirty scalding water.They become heavily contaminated by various types of microorganisms through this mishandling, harvesting, transportation, storage and through processing and serving (Patterson and Gibbs, 1979, Harry and William 1986 and Lotfi et al. 1988). In USA and UK the eyes

are examined for presence of squamous cell carcinome (epithilioma). They are condemned for this reason, In Germany they are excluded, but in Egypt they remain attached to the head and still edible.

In Egypt, the eyes and its surrounding muscles of slaughtered food animals (Gohara) constitute a popular part of the cooked head meat in special offals serving shops (Masmat).

The object of the present study is to evaluate the bacteriological status of raw eyes (Gohara) of slaughtered cattle, buffaloes and camels.

MATERIAL AND METHODS

30 samples of raw eyes each of cattle, buffaloes and camels were collected from Cairo slaughter house (offal-processing area) in sterile polyethylene bags in ice sampling box and quickly transmitted to laboratory, where they subjected to the following:

1. Measurement of the initial pH-value within one hour from slaughter, using the digital pH-meter (Hofmann, 1987).

2. Determination of aerobic plate count/g. using the drop plate technique recommended by ICMSF (1978).

3. Determination of Enterobacteriaceae count/g. according to Gork (1976) using crystal violet bile glucose agar.

4. Determination of coliforms (MEN/g): The technique recommended by ICMSF (1982) was adopted.

5. Isolation and identification of suspected coliform organisms on Eosin Methylene blue agar plates according to Krieg and Holt (1984).

6. Determination of staphylococcus aureus count/g. according to ICMSF (1978).

7. Detection of salmonellae, the recommended method by Harvey and Price (1981) was applied.

RESULTS AND DISCUSSION

The results recorded in Table (1) show that the mean pH-value of the examined raw eye samples of slaughtered cattle, buffaloe and camels within one hour post-slaughter was 6.64 $\pm$ 0.04, 6.39 $\pm$ 0.04 and 6.41 $\pm$ 0.04 respectively.

Measurement of the initial pH-value is one of the objective methods developed for registrating the deviation in meat quality (Reuter, 1982 and Haussermann, 1985).

The eye as a part of the head, the obtained pH-values were nearly similar to that of freshly slaughtered raw muscles recorded by Schilling (1986) and El-Sherif (1988). pH-value is one of the meat quality parameters, after slaughter the pH-value of the muscles normally ranged between (7.5 - 7.0) falls gradually to become (5.9 - 5.4) after 48 hours (Hofmann, 1987). Low pH-value inhibits the growth of pathogens and spoilage organisms in meat (Brown and Baird-Parker, 1982).

Table (1): Statistical analytical results of pH-value of examined raw eyes (Gohara) after one hour post-mortem

Animal	No. of Samples	pH - value			
		Min.	Max.	Mean	S.E.+
Cattle	20	6.48	6.80	6.64	0.04
Buffalo	20	6.27	6.58	6.39	0.04
Camel	20	6.33	6.59	6.41	0.04

Tabe (2): Statistical analytical results of bacteriological examination of raw eyes (Gohara)

Animal	APC				Enterobacteriaceae count				Coliforms count (MPN)			
	Min.	Max.	Mean	S.E.M	Min.	Max.	Mean	S.E.M	Min.	Max.	Mean	S.E.M
Cattle	$4x10^5$	$2x10^7$	$7.2x10^6$	$2.2x10^6$	$2x10^3$	$2x10^5$	$4.4x10^4$	$2.2x10^4$	4.3x10	$1.1x10^2$	$5.7x10^2$	$1.5x10^2$
Buffaloe	$2x10^5$	$4x10^6$	$2x10^6$	$0.58x10^6$	$2x10^3$	$1x10^4$	$4.5x10^3$	$1.3x10^3$	$3x10^2$	$1.2x10^3$	$8.1x10^2$	$1.7x10^2$
Camel	$4x10^5$	$2x10^6$	$1x10^6$	$0.23x10^6$	$2x10^2$	$2x10^3$	$9x10^2$	$3.4x10^2$	9.3x10	$4.6x10^2$	$3.3x10^2$	$0.58x10^2$

Bacteriological quality of raw eyes (Gohara)

The mean aerobic plate count/g. of the examined raw eye samples was recorded in table (2).

According to the microbiological limits of standard plate count of edible offals suggested by Thatcher and Clark (1975), all the examined eyes of buffalo and camel were acceptable, while 20 % of the examined cattle raw eyes were considered unacceptable.

The microbial load of the examined samples indicate neglected sanitary measures during preparation and handling in the offal processing area inside the slaughter house.

Results reported here-in indicate that, the mean enterobacteriaceae count/g. was $4.4x10^4 \pm 2.2x10^4$, $4.5x10^3 \pm 1.3x10^3$ and $9x10^2 \pm 3.4x10^2$ of the examined raw eyes of cattle, buffalo and camel respectively. While the mean MPN/g. of coliforms was $5.7x10^2 \pm 1.5x10^2$, $8.1x10^2 \pm 1.7x10^2$ and $3.3x10^2 \pm 0.58x10^2$ of the examined samples respectively.

Detection of enterobacteriaceae indicates bacterial proliferation, which allow multiplication of wide group of pathogenic and toxigenic organisms constituting a puplic health hazard (Mossel and Vincentie, 1969, Hechelmann et al. , 1973, Cox et al. 1975 and ICMSF, 1978).

Presence of coliforms in meat and meat products may render them of inferior quality and may give rise to public health hazards (Thatcher and Clark, 1968; Chambers et al. 1976 and ICMSF, 1978). The data obtained indicated that samples of buffaloes were highly contaminated with coliforms in comparison to those of cattle and camels.

Concerning the Staph. aureus count (Table 3), it was found that 10 out of 20 eye samples (50 %) each from cattle, buffalo and camel proved to be contaminated

with Staphylococcus aureus and the mean value of the examined eye samples of cattle, buffalo and camel was $1.4x10^2 \pm 0.7x10^2$, $6.1x10^2 \pm 4.4x10^2$ and $4x10^2 \pm 2.9x10^2$ respectively.

Detection of staphylococci in raw meats indicat bad hygienic condition and presents a great risk because it can grow rapidly in atmospheric temprature ranging from 20 to 45°C and can produce toxins in the presence of oxygen. (Shelton et al. ,1962 and Minor & Marth, 1976).

Table (3): Statistical analysis of Staph. aureus count/g. of the examined raw eye samples

Animal	Positive		Min.	Max.	Mean	S.E.M.
	No.	%				
Cattle	10	50	10^2	$6x10^2$	$1.4x10^2$	$0.7x10^2$
Buffalo	10	50	$2x10^2$	$3x10^3$	$6.1x10^2$	$4.4x10^2$
Camel	10	50	$2x10^2$	$2x10^3$	$4x10^2$	$2.9x10^2$

Results achieved in table (4) show that, E.coli, Citrobacter frundii, Enterobacter aerogenes, Enterobacter cloacae, Klebsiella ozonae, K. pneumoniae, Morganella morgani, P. vulgaris and Shiegella bodyii could be isolated from the examined samples at varying percentages ranging from 26.66 % to 46.66 %. Such isolats may constitute a public health hazards (Abd El-Aziz, 1973, ICMSF, 1978 and Krieg and Holt, 1984).

Presence of E.coli in raw meat or offals is an indication of faecal pollution. However the growth of this organism in meat resulting in undesirable changes and concequently economic losses.

Moreover, E.coli has been implicated in cases of food borne infection outbreaks (Mackie and MacCartney,1962) cholera like illness is caused by toxigenic strains

while invasive strains produce the dysentery like syndrome (Bryan, 1979).

Besides the effect of Proteus vulgaris on the keeping quality of meat and meat products, they have been incriminated in cases of food poisoning, gastroenteritis as well as urinary affections (Burrows, 1968 and Wassef, 1969).

Shigella is one of the bacterial food borne illnesses, mainly in connection with desentry. The shigellae have been shown to be transmitted through contaminated food by human excreta as well as, contamination via flies (Kaiser & Williams, 1962; Wilson & Miles, 1964 and Hobbs, 1974).

Since a small number of cells can cause infection, poor personal hygiene within the food handling chain could be hazardous and should be considered to prevent contamination with such organisms (Frazier,1967 and Wassef 1969).

Table (4): Incidence of isolated coliforms from examined samples

Isolats	No. of samples	%
Citrobacter freundii	20	33.33
Enterobacter aerogenes	28	46.66
Enterobacter cloacae	20	33.33
E.coli	24	40.00
Klebsiella ozonae	16	26.66
Klebsiella pneumoniae	16	26.66
Morganella morgani	20	33.33
Proteus vulgaris	24	40.00
Shigella boydii	16	26.66

From the obtained results of the examined raw eyes samples of slaughtered animals, it can be concluded

that, during the slaughtering process in the old Cairo abattoir contamination of meat offals by intestinal pathogens can not be avoided. The bad hygiene in this slaughter house can be attributed to its old buildings with heavy traffic round it and the animals were slaughtered without previous cleaning so, edible offals were subjected to contamination from skin or hide, bad transportation, mishandling and collection on uncleaned floors.

To produce high quality raw edible offals, contamination during preparation should be avoided by improvement of butchery hygiene. Training and supervision are important to assure evisceration without contamination of the carcase. Frequent cleaning of working and cutting tables with rapid processing of offal products without delay, in addition, to educational programmes should be imposed for processors and handlers to improve the quality of raw edible offals which are not less important than raw meat to ensure a maximum of safety to large number of offals consummers.

SUMMARY

20 samples of raw eyes each of cattle, buffalo and camel were examined bacteriologically. The obtained results revealed that the mean value per grams of aerobic plate count were 7.2×10^6, 2×10^6 & 1×10^6, of cattle, buffalo and camel eyes respectively.

Enterobacteriaceae count were 4.4×10^4, 4.5×10^3, 9×10^2 while Coliforms (MPN) were 5.7×10^2, 8.1×10^2, 3.3×10^2/ gm of examined cattle, buffaloe and camel eyes respectively.

The public health significance of isolates, camels samples were less subsected to contamination than those of cattle and buffaloes the probable source of eyes contamination and suggestive measures to avoid health hazards were discussed.

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