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Intoxication by Consumption of Raw Camel Liver

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Abstract: 97 raw camel liver consumers were approached by the questionnaire in Elfashir, Dammer and Tambol. Information excavated included personal information about their ages, education, occupation, health, medications some were permanently taking, dietary habits pertinents to consumption of camel products including liver and accompanying condiments, information pertaining to intoxication by raw camel liver consumption was obtained including the believed possible aetiology, onset of signs and pathogenesis and morbidity of signs among companion consumers. Other facts were deduced from co-relation of different variables of data

Key words: Intoxication, condiments, liver, consumption

INTRODUCTION

Camel products are the principal diet in many regions of the Sudan, Schwartz *et al.*[1] reported that local markets in Darfur, Kordofan and Butana absorb meat of old and unproductive animals, he concluded that the camel is perfectly suited to exploit arid areas where other domestic herbivores often fail to survive, let alone to produce. In such thereabouts camel products became a necessity and raw camel liver is a celebrity even in urban societies[2]. Suggested that research on camel meat is an absolute priority for the Sudan; hygiene and consequences of raw camel liver consumption in the Sudan is a priority. Poisoning by raw camel liver consumption is not uncommon, the Federal Ministry of Health[3] reported 1440 cases of food poisoning, no details available, let apart the cases not reported. The ethno-belief that consumption of camel liver in the rainy season and that camel liver treated with ox-bile as a condiment are toxic was targeted by the present questionnaire.

MATERIALS AND METHODS

Data collection: Questionnaire forms were explicit, easily and shortly answered and designed susceptible to the succeeding statistical procedures

Population: The initial population was 120 individuals in one stratified sample with three sub-population in Elfashir, Tambol, Dammer.

Data organization and summary: Data were evacuated into tables according to the sub-populations, unorderly and faulty sheets were excluded.

Descriptive analysis: Determination of mean values, their Standard Error Mean (SEM) in the sample.

Analysis of variance (ANOVA): Comparing numeral data from the sub-populations using the ANOVA table and the critical values of F-distribution.

Normal distribution (Z-distribution): The Z values of different variables were compared to detect whether the difference between the readings was statistically significant.

RESULTS

Description of the population which participated in the questionnaire is given in Table 1.

The dietary habits of the sample approached by this study, according camel liver and ox bile, are given in Table 2

The consumers self-restrictions towards camel liver from certain areas and in the rainy season are given in Table 3.

The experience of the population approached with this questionnaire with the consumption of the mixture of camel liver with ox bile is given in Table 4.

The intoxication by the mixture of camel liver and ox bile within the population of the questionnaire is described in Table 5.

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Correlation between the 3 areas approached in this investigation and the beliefs of the individuals pertaining to the subject of the investigation are given in Table 6.

Intoxication by the mixture of camel liver and ox bile correlated to certain variables in this study is given in Table 7.

DISCUSSION

The results suggest that certain changes occur that render some camel liver toxic in the rainy season in the 3 areas investigated, a fact admitted even by those individuals who claimed eating camel liver in rainy season, some of them were rural butchers and tribesmen well

Table 1: Description of a sample of people questioned about camel liver consumption in 3 different areas in the Sudan

Variables	Variable items	Frequency	Percent
Area	Tambol	31	32.0
	Damer	30	30.9
	El Fashir	36	37.1
	Total	97	100.0
Age	< 20 years	22	22.7
	21-40 years	36	37.1
	41-60 years	24	24.7
	>60 years	15	15.5
	Total	97	100.0
Education	Illiterate	11	11.3
	Primary school	19	19.6
	Secondary school	43	44.3
	University	23	23.7
	Post university	1	1.0
	Total	97	100.0

Table 2: Consumption of camel liver and ox bile in a sample of people from 3 different areas in the Sudan

Variables	Variable items	Frequency	Percent
The consumption of camel meat	No. of people who eat camel meat	72	74.2
	No. of people who do not eat camel meat	25	25.8
	Total	97	100.0
Purpose of consuming camel meat	Food habit	88	90.7
	Therapeutic purpose	5	5.2
	Special believes	1	1.0
	Total	97	100.0
Consumption of camel liver	No. of people who eat camel liver	88	90.7
	No. of people who do not eat camel liver	8	8.3
	Total	97	100.0
Frequency of camel liver consumption	Once	5	5.4
	More than one time	51	55.4
	Regularly	36	39.1
	Total	92	100.0
Ways of consuming camel liver	As a separate meal	48	52.1
	With other food	42	45.6
	After other foods	5	5.4
	Total	92	100.0
Consumption of ox bile	No. of people who eat camel ox bile	70	77.7
	No. of people who do not eat camel ox bile	22	24.4
	Total	90	100.0

Table 3: Some self-restrictions by a sample of consumers against camel liver consumption

Variables	Variable items	Frequency	Percent
The consumption of camel liver in the rainy season	No. of people who eat camel liver in the rainy season	60	65.2
	No. of people who eat camel liver in the rainy season	32	34.8
	Total	92	100.0
The consumption of liver from camels from all the regions in the Sudan	All areas	63	68.1
	Certain areas	25	27.5
	Avoid certain areas	4	4.4
	Total	92	100.0

Table 4: The experience of a sample of consumers from 3 different parts of the Sudan with the mixture of camel liver and ox bile consumption

Variables	Variable items	Frequency	Percent
Problems cause by the consumption of ox bile	No. of people who have no problems	82	91.1
	No. of people who have problems	9	8.9
	total	90	100.0
The consumption of camel liver mixed with ox bile	No. of people who consume this mixture	31	34.4
	No. of people who do not consume this mixture	59	66.6
	Total	90	100.0
Frequency of the mixture consumption	Once	25	80.6
	More than one time	6	19.4
	Total	31	100.0
The intoxication by the mixture	No. of people intoxicated	17	54.8
	No. of people not intoxicated	14	46.2
	Total	31	100.0

Table 5: Toxicity in a sample of people intoxicated by camel liver and ox bile mixture in the Sudan

Variables	Variable items	Frequency	Percent
Development of toxicity	No. of people immediately intoxicated	15	88.2
	No. of people intoxicated after a period	2	11.8
	Total	17	100.0
The ways of consumption of the			
mixed camel liver with ox bile	No. of intoxicated people who consumed this mixture as only food	14	82.4
	No. of intoxicated people who consumed this mixture with other foods	3	17.6
	Total	17	100.0
The people intoxicated by the mixture	No. of people who consumed the mixture alone	5	29.4
	No. of people who consumed the mixture with other people	12	70.6
	Total	17	100.0
Similarity of poisoning symptoms in the sample	No. of people who showed the same symptoms	11	29.4
	No. of people who did not show the same symptoms	6	70.6
	Total	17	100.0

Table 6: The pattern of camel liver consumption in a sample of people relative to their areas in the Sudan

Variables	Variable items	Percent	Significance
People who do not consume camel liver in the rainy season	Tambol	25.0	0.05
	Damer	22.0	
	El Fashir	51.0*	
People who believe camel liver and ox bile mixture is toxic	Tambol	21.1	0.01
	Damer	16.5	
	El Fashir	63.4*	

* Significant result

Table 7: Intoxication by camel liver and ox bile mixture in a sample of people in the Sudan correlated to some other variables

Variables	Variable items	Percent	Significance
People intoxicated by the mixture	Tambol	3.4	0.00
	Damer	3.3	
	El Fashir	50.0*	
Intoxication in diseased people	People intoxicated and had disease	87.5	0.064
	People intoxicated and had no disease	81.3	
Intoxication in people using drugs	People intoxicated and had been using drugs	6.3	0.067
	People intoxicated and had not been using drugs	16.9	
Intoxication correlated to the	People who eat the mixture and got intoxicated	89.3*	0.05
mixture of camel liver and ox bile	People who eat the mixture and were not intoxicated	10.7	

* Significant result

acquainted to the product who claimed that they know the poisonous liver from morphology, size and consistency, a claim that can not be absolutely denied, O'hag *et al.*[4] having achieved the best results with the longest treatment period, in patients of ascites treated by camel urine, reported; interestingly, in the original questionnaire of tribesmen using urine therapeutically, a more prolonged regime of consuming camel urine was reported. It was determined that the sample contra- indicated camel liver in the rainy season and camel liver mixed with ox bile, when the variables were correlated 51% of those who contra-indicated liver in the rainy season were from Elfashir, 63.4% of those who contra-indicated the liver mixture with bile were from Elfashir and 50% of those previously intoxicated by the mixture meat were from Elfashir, these statistically significant percentages are justified by the fact that Elfashir is the principal area for the production and consumption of camel products. When the variables were correlated variables other than the mixture eaten were not determinant intoxication factors, 89% of those who have eaten the mixture were intoxicated, the only possible justification is that this mixture in the people's beliefs and experience is toxic.

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