

AN OVER VIEW OF EFFORTS MADE IN LIVESTOCK PRODUCTION AND DEVELOPMENT FOR MEAT PRODUCTION PROJECT OF LDDB

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ABSTRACT

The summary status of the project, "Livestock Production and Development for meat production" of Livestock and Dairy Development Board (LDDB) of Ministry of Livestock and Dairy Development (MINLDD), Government of Pakistan, Islamabad revealed that this project was initiated in 2007 under PSDP with an allocation of Rs. 485.88 millions upto 2010, achieved the Feedlot Fattening Farm Operation, completing the Registration of establishing 7740 Beef Farms, 5431 Mutton Farms, Producing 0.164 Beef and 0.217 mutton animals. This was achieved with the continuous Technical Assistance of manpower employed for technical feasibilities for Slaughter Houses (SH) and Butcheries, eighty (80) progressive farmer's Groups namely Meat Production Processors Interest Groups (MPPIGs) established. A total of 736 farmers and 25 Professionals trained on Feed lot fattening farms, including 08 persons trained in two foreign trainings arranged for meat cutting and processing in Malaysia and Philippines. Project information Network (PIN) has been developed and LDDB Website www.lddb.org.pk is established for facilitation of meat producers in the country.

Key words. LDDB MINLDD GOP Pakistan
Feedlot Fattening Farms. Meat Production.

INTRODUCTION

During the year 2004-05, with the approval of "Farmer friendly-Livestock Policy", Mega Development Projects were initiated. Under this policy, following mega development projects were got approved through Public Sector Development Projects (PSDP) by GoP:-

- Strengthening of Livestock Services Project (SLSP)
- Milk Collection, Processing and Dairy Production & Development Program (MCP& DDP)
- Prime Minister's Special Initiative, for Livestock (PMSIL)
- National Program for Control and Prevention of Avian Influenza (NPCPAI)
- Improving Reproductive Efficiency of Cattle and Buffaloes (IRECB) in smallholder's production system
- Up gradation and Establishment of Animal Quarantine Stations in Pakistan.
- Livestock Production & Development for Meat Production (LPDMP).

The last projects namely "Livestock Production and Development for meat production" was implemented during 2007-2011 and upto June 2010 Rs. 485.88 millions were released against the total allocation of Rs.1520.847.

The main objectives included (i) Establishment of feedlot fattening to optimize economical meat production (ii) Development of slaughterhouses and butcheries for value addition in private sector (iii) to increase linkages among the meat producers processors and (iv) Capacity building of stakeholders, for meat production and processing, the establishing of

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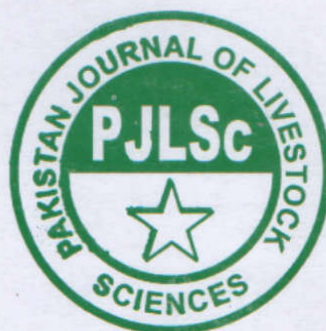
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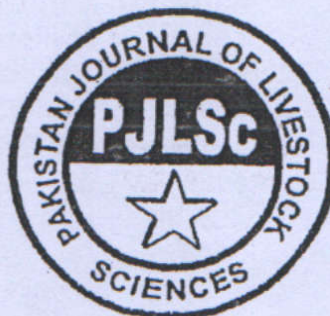
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KEY NOTE BY THE PATRON IN CHIEF

In the name of Almighty Allah (SWT) The Beneficent, The Merciful, Peace and his Blessings be on last of his Prophets, Muhammad (SAWS)

It gives me tremendous, delightful and satisfaction at the occasion that The Editorial Board of Pak: Journal of Livestock Sciences (PJLSc) Islamabad have sustained their dedications and this Third Volume has successfully been published, as their annual endeavor.

The scientific papers received from various Institutions, in Livestock Production specifically in the fields of animal nutrition and animal health which is an approach throughout the world to address this issue.

Interested Scientists from our National Institutions, in the field of agriculture and Social Sciences have contributed their efforts in PJLSc. My heartfelt thanks and appreciation are due to the Editorial Board, the learned Referees who have stood with their commitments and rally this document, now in hand, is available for students, academicians, Researchers and Administrators within the country and abroad

It is also a matter for our moral support that the number of clientage (which was 83 in the year 2010), has now reached 215 out of which 21 are international. The increase in clientage is a positive sign of confidence built in the Scientists who contributed in 2008-09, and the authors of 2010 is being realized as a full time responsibility of the Editing staff, at PJLSc Office, Bhara Kahu, Islamabad, Pakistan. I am always supporting this team for the publication of this precious document, in the private sector of Pakistan with limited resources.

May Allah Almighty Bless all of us for this sustained commitment and I.S.A dedication.

Mashook All Bhutto
Patron in Chief

EDITORIAL

Bismillah-Ir-Rehman-Ir-Rahim

This Volume-III, No.03 of Pak: Journal of Livestock Sciences (PJLSc) comprising mostly the Research Papers on Animal Nutrition (specially the feeding of various combinations/varieties of feeds to growing kids and calves) is now finally been printed. This is an area of Livestock Production mostly discussed amongst farmers, the policy formulating Apex Bodies of the country and abroad. The papers from Agriculture & Social Scientist is also welcomed.

Amidst price hike of various commodities, specially the grains and fodder, specially in the drought season of November-March, in an agricultural country like Pakistan, alternative arrangements of feed resources warrants agriculture farmers to grow fodder crops, specially the grasses and on increased portions of their lands. This has been recommended in various forums symposia/seminars and conferences, at home and abroad.

The Editorial Board welcomes all kinds of Research Papers, specially the Social Sector but the priority will always be on FIRST-COME-FIRST-SERVED basis, subject to referee's advises are attended, in time, by all authors.

The Editorial Board is always thankful to all the referees who have spared their time for review, evaluation putting in grammatical and technical expertise, for further polishing the research papers of researchers of the country.

In this volume-III (No.3) have received research papers from Sindh Agriculture University Tandojam, NARC, University of Arid Agriculture and NGOs. The authors are appreciated for their in time coordination in this endeavor.

Letters of appreciations, telephone calls and SMS messages for improvements, publishing the PJLSc twice a year, (Biannual) and increasing number of papers in each volume are continuously pouring in, but the decision of the Editorial Board remains limited to the financial resources. This is one the top of our agenda. Please wait. May be we may be able to make it just in 2012 or 2013. HEC is simultaneously being approached for Financial assistance.

The Editorial Board is thankful to our US and UK Coordinating Editors for **Indexing and abstracting** PJLSc both Volume-I & II including this volume in hand. The work is actively in progress.

Hopefully we are getting this work done ON LINE, soon.

Dr. Muhammad Hafeez
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feed lot units /Fattening Units in Beef and Mutton involving interested farmers where animal health coverage and other services were to be provided at the farmers doorsteps. Other objectives were to encourage slaughter houses and butcheries in private sector alongwith linkage of meat producers with meat processors towards the total goal of "increased meat production" in the country, with the following facilities:-

- Technical feasibilities for establishing beef and mutton farms prepared in both Urdu and English languages and distributed among the farmers.
- Technical support for establishing and operation of farms including shed design, feed formulation advice, critical preventive animal health cover i.e. de-worming, antibiotics and 100% vaccination being provided through technical field staff.
- Operational and Financial Support up to Rs.1400/- per fattened calf and Rs.400/- per fattened sheep and goat.

RESULTS

Establishing feed lot fattening farms. The following table will provide the details of province wise beef and mutton farms, province wise beef/mutton animals produced upto June-2010.

Feedlot Fattening Farm Operations completed up to June, 2010						
Province	Beef Farm	Mutton Farms	Total Farms	Beef Animals	Mutton Animals	Total Animals
Punjab	3534	729	4263	84852	528667	113519
Sindh	2099	1924	4023	39855	70421	110276
KPK	1187	746	1933	25639	27526	53165
Balochistan	587	1797	2381	9894	82435	92329
AJK	282	108	390	2975	3859	6834
Gilgit/Baltistan	51	127	178	762	4793	5555
Total	7740	5431	13171	163977	217701	381678

The table indicates that a total of 7740 beef farms registered where cattle and buffalo calves were raised for meat production. This comprised 3534 in Punjab, 2099 in Sindh, 1187 in Khyber P.K., 587 in Balochistan, 282 in AJK and 51 in Gilgit Baltistan respectively. Simultaneously a total of 5431 Mutton farms were established where sheep and goats were raised for mutton production in the country. These comprised 729 in Punjab, 1924 in Sindh, 746 in Khyber P.K., 1797 in Balochistan, 108 in AJK and 127 in Gilgit/Baltistan respectively.

Both the farms established registered for beef and mutton were 13171 in the country upto June-2010. Cumulatively 163977 beef animals (cattle & buffalo calves) and 217701 mutton animals (sheep & goats) were produced within a period of four years (2007-2010)

Capacity Buildings

In addition to mutton and beef animals produced, the following efforts were also made for capacity buildings:-

- ◆ 736 farmers trained to operate feedlot fattening farms, on scientific basis.

- ◆ 25 professionals trained in feedlot fattening and meat technology.
- ◆ Arranged 02 foreign trainings on meat cutting and processing in Malaysia and Philippines in which 08 participants were trained.

Meat Production and Processors Interest Groups (MPPIGs)

- ◆ MPPIGs established in each Province, Sindh, KPK, Balochistan and Gilgit/Baltistan.
- ◆ 80 progressive farmers from all over the country were registered as MPPIG's.

Slaughterhouses and Butcheries

- ◆ Technical feasibilities for both slaughterhouses and butcheries prepared and distributed to the interested investors.
- ◆ 78 Expression of Interest (EOI's) received for establishing 24 modern butcheries and 34 for slaughterhouse.
- ◆ Procurement procedure for purchase of butchery equipments was finalized.

Information and communication Network

Project Information Network (PIN) was developed, based on database pertaining to feedlot Farms, slaughterhouses and butcheries. All data is available on LDDDB website www.iddb.org.pk, for all concerned.

Export of Meat from Pakistan

The registered farmers of Meat, specially beef, are not only meeting the domestic requirements (60-65%) but also exporting meat (35-40%), as per Meat Export Policy, 2005-2006 of MINL&DD, and LDDDB. Ten (10) exporters, Four (04) each in Karachi and Lahore, while one (01) each in Karoor & Peshawar have respectively been Registered with the Ministry of Commerce and Animal Quarantine Department (AQD). The list is annexed with this write up. The meat export data can be obtained from AQD, Ministry of Commerce, GOP, Islamabad.

DISCUSSION

Meat production is far less as compared to the domestic needs of the country. We, as a developing nation need double the amount of animal proteins by the year 2020, as forecasted by Delgado (1993) who has years ago forecasted the demanded production of Meat (both beef and mutton). Thanks to the meat consumption trends of our people and the increased production of poultry meat in the country, the prices of meat are not shooting up with that accelerated speed as the other commodities, in the country as narrated by Hafeez. (2007-08) a comprehensive write up towards investment in Livestock, Hafeez 2010).

There is a need to attract livestock business community towards increased meat production, specially mutton and beef as resources of the GOP and Provinces have been limited. We can see that with the Government intervention of Rs.485.8 millions against Rs.1520.8 millions, of this project, during 2007-2010 a total of 0.164 millions mutton and 0.217 million beef animals could be prepared and produced. In addition to salaries of staff

and 736 farmers trained for general management, twenty five (25) professional personnel were also trained in feedlots trainings, facilities could also available of, in Malaysia and Philippines in which 08 persons got trained. While a total of eighty (80) farmers were registered upto 2010. There is a need of implementing such projects Not only by the GOP, LDDDB, but provinces should also come up with similar projects, may be with less allocations but on sustainable basis, hoping that the registered farmers may double with double number of farms registered and these farmers become breeder-cum-Production farmers in the coming days, InshaAllah.

List-1 Showing the registered slaughter houses for export of meat.

Sr. #	Name	Company Name	Address
01	Mr. Tariq Mahmood Butt	M/s P.K. Livestock & Met Co. (Pvt.) Ltd.	Moosa Goth, Razzak Abad, national Highway, Karachi
02	Mr. Arif Ghias	M/s Zenith Associates	3.5 Km Managa Mandi, Rainwind Road, Lahore
03	Malik Iftikhar	M/s M. Artal Poultry International (Pvt.) Ltd	292-A Street# 6, Old Cavalry Ground, Lahore Cantt
04	Mr. Raja Faisal Daud	M/s Pakistan Food Products	Bukhari Farms, Behind government Rice Godown Deh Jraahim Pipri, Landhi, Karachi.
05	Mr. Mohammad Khalid	M/s Kat Co	Mureedkay Road, Lahore
06	Mr. Nasib Ahmed Saifi	M/s Anis Associates (Pvt.)	1 Km Raiwind Manga Road, Distt. Kasur
07	S.M. Islam-uddin	M/s Snow King Fresh & Frozen Foods	D-15, Sid Industries Trading Estate, North Karachi Scheme # 33, Karachi
08	Mohammad Javed	M/s IJ Farm House	Plot # 89 Deh Khanto Opposite Lashari Goth, Razzaqabad, Bin Qasim Town, Karachi
09	Ch. M. Nawaz Dogar	M/s Abedin International	Raiwind bypass Chunain Road, Lahore
10	Fayyaz Khan	M/s Hamza Halal Food	Budaani Road near Khyber Gas (Pvt) Ltd. Area Najoi, Peshawar.

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AWARENESS OF DYSLEXIA AMONG PRIMARY SCHOOL TEACHERS

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ABSTRACT

Developmental dyslexia, characterized by unexplained difficulty in reading is associated with behavioral deficits in psychological processing. Functional neuron imaging studies have shown a deficit in the neural mechanisms, underlying psychological processing in the neural mechanisms underlying psychological processing in children and adults with dyslexia. The present study examined the awareness of dyslexia among primary school teacher and stress faced by students, during psychological processing, before and after a remediation program focused on auditory processing and oral language training. Behaviorally, training improved oral language and reading performance. Physiologically, children with dyslexia showed increased activity in multiple brain areas.

Keywords: Dyslexia awareness school teachers Rawalpindi/Islamabad - Pakistan.

INTRODUCTION

The British medical literature revealed the first description of a specific reading disability in 1896. A "bright and intelligent boy" who had great difficulty in learning to read. This intrigued the educators and subsequently more similar cases were recorded and dyslexic disorders were officially recognized as a learning disorder. There were many unexpected difficulties in learning to read, despite intelligence, motivation and educational opportunities.

We are now aware that dyslexia is a disorder that affects millions of people around the world. In-fact it is said that 5 – 15% of the world population i.e. approx. one billion people, maybe diagnosed suffering from various degrees of dyslexia.

The word Dyslexia –Dsy-Means "difficulty" and lexia means "words" around the world. In-fact it is said that 5-15% of the world population i.e. almost one billion people may be diagnosed suffering from various degrees of dyslexia.

This disorder is one type of specific leaning disability. It commonly affects the person who has difficulty in verbal skills, abstract reasoning, hand-eye coordination, concentration, perception, memory and social adjustment. These problems result in the individual having poor grades and become classified as an under achiever.

The domino: affect has started. Due to this, the dyslexic child is often labeled as lazy, of low intellect and unmotivated. Eventually this affects the child's personality resulting in a low self-esteem. The Child often takes on the role of becoming the class down, being rebellious, feeling like a misfit and keeping to himself, difficult, refusing to attend school and goes neglected in a long run.

Some children may initially have fewer problems in leaning a language in school, but their problem may be aggravated as they learn more intricate parts of a language like grammar, or understanding of textual material.

People with dyslexia can have enormous difficulties in making sense of reading, writing and spelling. Nowadays there is much that can be done. Dyslexia is a recognized condition and, if identified early, people can generally be helped to find ways to cope with their problems and acquire the skills, all, need to reach their potential. Some dyslexic people experience visual discomfort when they read. Experts have produced design guidelines to alleviate these problems and make reading material more accessible to dyslexic readers.

- Some dyslexic people can read more easily when there is less glare and find different coloured texts and back-grounds make a great difference. On this module the background colour can be changed to suit individual reader(s).
- A large simple type face has been used.
- The text has been well spaced, with extra space given after each paragraph, around headings and in lists.
- Links to other sections have been given at the end of each section again well spaced.
- Sentence structure has been kept as simple as possible.
- Full stops have been put at the end of headings. This is an aid for people using speech software. The software will recognize this text as a heading.
- The text can be printed out easily.

Dyslexia is a common type of learning difficulty that primarily affects the skills involved in reading and spelling of words. Dyslexia should be recognized as a spectrum disorder, with symptoms ranging from very mild to very severe. In particular, people with dyslexia have difficulties with:

- Phonological awareness and
- Verbal memory

This study was carried out with the following of its **objectives**:-

- To know the awareness level of dyslexia among teachers (specially primary school teachers).
- To study whether the elite class school teachers are more aware of dyslexia as compared to lower class school.
- To study whether or not lack of awareness in lower class school teachers lead to stress among students.
- To study whether or not unaware teachers lead to a student's worst conditions, if not treated properly.

REVIEW OF LITERATURE.

Some of the recent work, reviewed is presented as under:-

Augustine (2001) remarked with astonishments upon the fact that Saint Ambrose, the Bishop of Milan, could read silently, without pronouncing and words aloud. Speculating on this remark, historians have suggested that, in those times, the majority of readers only knew how to read aloud: they did not practice reading silently to themselves. It is plausible that comparative genetic studies of populations whose linguistic systems differ will reveal

some clues about the evolutionary path of normal and/or dyslexic reading in modern civilization.

Vellutino et al, (2002) denoted dyslexia characterized as a problem with word recognition when speaking out loud. These problems were not specific to particular languages and the Intelligent Quotient (IQ) of individuals concerned. It could take the form of problems with phonological skills recognizing how to use the conventional sound structure of words, and atypically slow speed of remembering how to say words. (Grigorenko, 2001). Reported the type of dyslexic difficulties as could be linked to the child's first language. The simpler and more consistent the mapping of the alphabetic letters/symbols to sounds in a language, the less risk there will be of children suffering phonological problems, In fact, languages with more complex orthographies, such as English, had greater occurrence of this type of dyslexia. The research literature found this to be true for various languages with differing degrees of orthographic complexity.

Goswami (2004) gave a detailed description of types of dyslexia, from mild to severe, and including surface and phonological emphasises that the ability to detect rhyme forms in speech was part of the normal development of pre-reading skills in young children (in different languages) and the ability could be less evident in some dyslexics. Longitudinal studies in Sweden, which followed young children with dyslexia through to adulthood, had provided evidence that early phonological deficits could persist through adulthood (Svensson & Jacobson, 2006). In Cantonese, a specific problem children experienced was often due to the speed of remembering words.

Snowling et al (2008) emphasized the importance of early identification in pre-readers of a very young age of the precursors of dyslexic-type symptoms in order to facilitate the development of compensatory reading strategies. Indeed, Snowling and Hayiou-Thomas (2008) suggest that with appropriate intervention, children with average oral comprehension skills and classic dyslexia symptoms, also children with specific leaning impairments in both oral and written comprehension, should be able to respond to appropriate teaching interventions to become relatively normal readers. Their model was developed in response to new knowledge and understanding about co-occurring syndromes and assumes that some poor readers with phonological difficulties, either severe or complex (co-occurring with non-phonological deficits), required a different forms of intervention. They proposed that tall intervention programmes should include fundamental skills that are important for reading comprehension.

The following hypothesis were kept in mind to carry out this survey study:-

- The awareness of dyslexia among teachers is very low.
- The awareness of Dyslexia is more in High class school than in lower class schools.
- The number of mentally stressed students is more in lower class schools.
- Unawareness among teachers leads to worst result among students.

MATERIAL AND METHODS:

The topic of our current research was the "Awareness of Dyslexia among primary school teachers". The targeted population was the teachers of primary sections from (i) elite class schools, (ii) Middle class schools and (iii) to lower class schools of Rawalpindi - Islamabad, twin cities.

Our sample size was 54. Eighteen (18) from each class schools, as middle, elite and lower schools. The data collection was done with the research instrument of a Questionnaire, comprising combination of different questions. The stratified sampling method was used.

To collect data for the purposes of investigating the awareness of dyslexia, the researchers personally visited the schools and distributed 18 questionnaires, in each targeted school. Data was collected from 20th to 28th of May, 2010. Teachers gave positive and frank responses, regarding this research work.

The data collected through the questionnaire, was analyzed, tabulated and interpreted in the light of our objectives. The analysis was done by using statistical techniques of Chi-square and Z proportional test. Results were displayed in various tables and graphical forms, where needed.

RESULTS AND DISCUSSION:

This section contains the result tables regarding awareness of dyslexia in primary school teachers.

Table-1 Showing the gender wise response of the teachers

Response	Higher	Middle	Lower
Males	06	03	01
Females	38	31	11
Total	44	34	12

The response of the female teachers was 67% while the response of male teachers was less than 33%, which was very low. Mostly female teachers were teaching in primary sections.

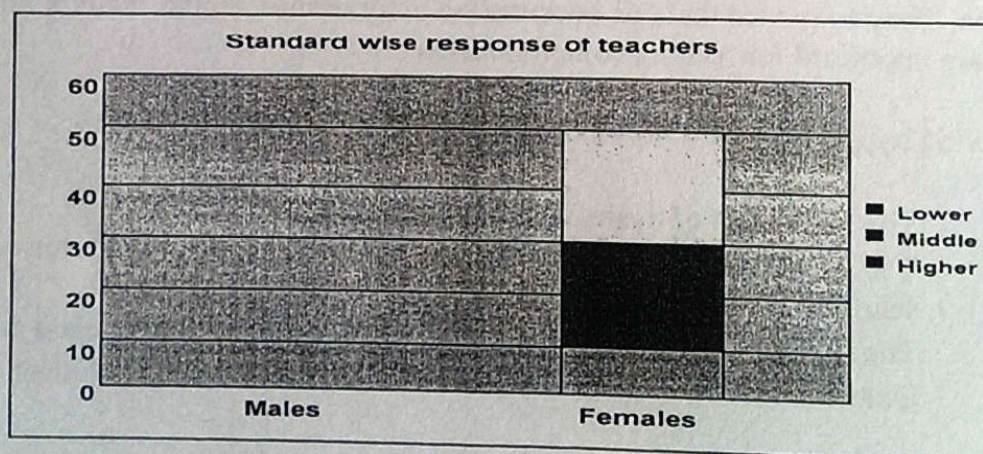


Table-2 Showing the nature of job of the teachers

Response	Frequency	Percent
Government	06	11
Private	48	89

A large majority of 89% were private schools & least majority 11% were having government jobs, as presented in table-2.

Table-3 Showing of importance in studies.

Response	Frequency	Percent
Learning	12	22
Practical work	39	72
Theoretical work	03	06

The larger majority of 72% teachers gave importance to the practical work in studies while 22% said that learning is necessary. Only 6% said that theoretical work is important, as presented in table-3.

Table-4 Showing reasons regarding unequal potential among students

Mental capability	44%
Lack of interest	50%
Teacher's fault	0
Parents negligence	0
Any learning disability	6%
Non	0

Equal majority of the teachers (50%) pointed out that due to lack of interest many students could not respond well. Forty four percent (44%) could not respond well due to mentally less capability and only six percent (6%) reported that less response due to learning disability was the reason of students as presented in table-4 along with graphically displayed, below:-

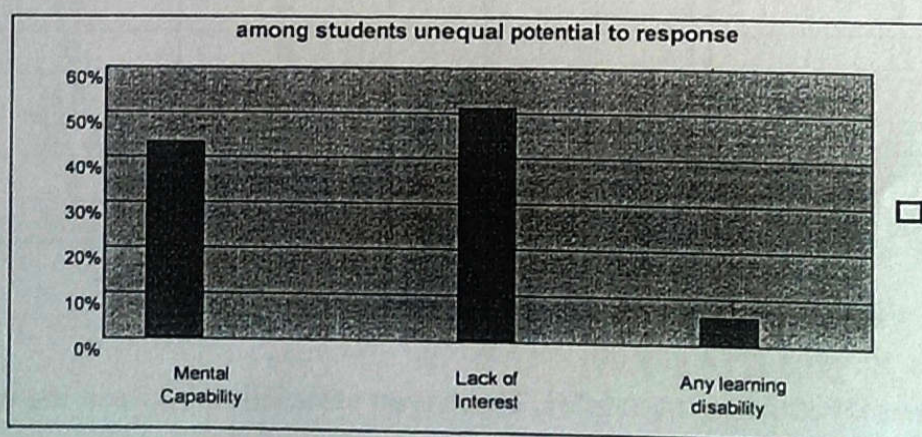


Table-5 showing expression regarding among student due to stress

Quantity	Student having stress		
	Yes	No	Total
High standard	08	10	18
Middle standard	11	07	18
Low standard	14	04	18
Total	33	21	54

Ho: there is no association between variables

Hi: there is association between variables

Table showing statistical versions of HO, (OE, OE-2 & OE/2.

O	e	o-e	(o-e) 2	(o-e)/2
8	11	-3	9	.81
11	11	0	0	0
14	11	3	9	.81
10	07	3	9	1.28
07	07	0	0	0
04	07	-3	9	1.28

$X^2 = 4.18$ Level of Significance = 0.05 (C-1) (R-1)

$X^2 > X^2_{0.05(2)} 4.8 > 5.99$

So our Hypothesis is accepted. There is no association between the two variables.

Table-6 Showing the facilities in school & stress among students

Facilities	Student having stress		
	Yes	No	Total
High standard	08	10	18
Middle standard	11	07	18
Low standard	14	04	18
Total	33	21	54

Ho: there is no association between variables

Hi: there is association between variables

O	E	O-E	(O-E) 2	(O-E)/2
8	11	-3	9	.81
11	11	0	0	0
14	11	3	9	.81
10	07	3	9	1.28
07	07	0	0	0
04	07	-3	9	1.28

$X^2 = 4.18$ Level of Significance = 0.05 (C-1) (R-1)

$X^2 > X^2_{0.05(2)} 4.8 > 5.99$

So our Hypothesis is accepted. There is no association between the two variables.

Table-7 Showing the Awareness of dyslexia among students is very low considering it a mental disorder

Category	High	Middle	Low
Yes	3	6	18
No	15	12	36
	18	18	54

Ho: there is no association between variables

Hi: there is association between variables

O	e	o-e	(o-e) 2	(o-e)/2/e
3	6	3	9	1.5
15	12	3	9	.75
6	6	0	0	0
12	12	0	0	0
9	6	3	9	1.5
9	12	3	9	.75
				4.5

$X^2 = 4.5$ Level of Significance = 0.05 (C-) (R-1) $X^2 > X^2 0.05 (2) 4.5. 5.99$
 So our Hypothesis is accepted. There is no association between the two variables.
 $P_i =$ no of people agreed (43) $P^2 =$ no of people not agreed (11)

$H_o = P_i - P^2 = 0$ $H_o = P_i - P^2 \neq 0$

Level of significance = 0.05 $Z = (P_i - P^2)$

$$S^2 D = \sqrt{\frac{P_1 q_1}{n_1} + \frac{P_2 q_2}{n_2}}$$

$Z_{cal} = 4.35$

Critical region is 0.025

$4.35 > 1.96$

So our hypothesis is rejected

Table-9 Showing the notion that spares the stick & spoil the child

Strongly agree	21	5	105
Agree	12	4	48
No response	0	3	0
Disagree	18	2	36
Strongly disagree	3	1	3

$$\frac{105+48=0=36=3}{54 \quad 54} = 192 = 3.55$$

Our result shows that most of teachers agree to that nation

Table-10 Showing the mental illness matters a lot than physical illness

Strongly agree	21	5	105
Agree	24	4	96
No response	0	3	0
Disagree	9	2	18
Strongly disagree	0	1	0

$$\frac{105+96+0+18+0}{54} = 4.05$$

Our results show that most of the teachers agree that mental illness matters a lot than the physical illness and that dyslexia is a mental disorder, as presented in table-10.

CONCLUSION

From our research work, it has been assessed that awareness of dyslexia among teachers is not well enough (44.4%) as the response given was against the awareness of dyslexia. It varied in higher, middle and lower class school teacher, 83.3%, 66.6% and 50% among lower school teachers. For most of the respondents, practical work holds more importance. It was clear from our research work that lack of interest and mental capability lead to unequal potential of response, among teachers. The unaware teachers lead to worst attitude of the student and in turn spoil his/her future. We have tried to find out the cause of stress among students and through our research concluded that the stress among students which was independent of quantity of students in class and facilities available, was the main reason.

RECOMMENDATIONS

- Awareness must be raised each at district level through for, in the country.
- Subjects regarding learning disability must be included in different courses, for teachers at Primary, Middle & Secondary levels.
- Awareness among parents must also be increased.
- Assessment test must be there about dyslexia for students.
- Students must be spared from ENT problems.
- Attention must be paid on the stressed students and teachers must know how to deal with them.
- The media must play a vital role by playing documentary program on dyslexia, to increase the awareness.
- NGO's regarding learning disability (dyslexia) must launch programs to play effective role.

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DETERMINATION OF FATTENING CAPABILITIES OF BUFFALO MALE CALVES FOR BEEF PRODUCTION

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ABSTRACT

A study was conducted to investigate the growth performance of 12 male Kundi buffalo calves to observe fattening capabilities. The calves were fed rations containing 12, 14, 16 and 18 percent Crude Protein (CP); the CP was balanced using cotton seed cake, rice polishing, mustard cake, wheat bran, maize crush, wheat straw and green fodder. The results revealed that the growth performance of buffalo calves was significantly ($P < 0.01$) improved by increase in CP levels. The calves managed under 16% CP ration consumed 37.70 kg average weekly feed and gained 4.95 kg weight with 7.68 FCR and generated highest net profit of Rs.1034.35/calf. Calves fed on ration containing 18% CP consumed lowest weekly feed (36.86 kg/calf) and 4.74 kg weight gain with 7.74 FCR generating net profit of Rs.400.60 / calf. Fattening calves fed on 14% CP ration consumed more feed (39.86) kg/calf, but weekly weight gain was 4.57 kg with 8.76 FCR and net profit Rs. 757.10/calf. Buffalo male calves fed on 12% CP ration consumed weekly feed of 39.01 kg producing lowest weight gain of 4.21 kg with 9.27 FCR generating net a profit of Rs.680.80/calf. The average daily weight gain of the calves fed on 12, 14, 16 and 18% CP ration was 600, 650, 710 and 680 g/calf. The calves in group C, where they were fed ration containing 16% CP had better beef production capabilities as compared to those fed on experimental rations containing 12, 14, or 18% CP levels. It was also noted that each increment in CP level in feed resulted better growth of calves, reduced feed intake, increased water intake, but CP level beyond 16% did not show economical results regarding fattening capabilities of the Kundhi buffalo calves.

Key Words: Fattening, Kundhi buffalo, male calf, crude protein, beef production Sindh, Pakistan.

INTRODUCTION

Meat is an important constituent of the human diet, as it is a rich source of digestible proteins and contains essential amino acids in suitable proportions. Pakistan is blessed with large population of Cattle, Buffaloes, Sheep, Goats and Camel the main source of red meat.

The protein available is 45.8 gm/head/day, including vegetables and from animals sources. The animal protein recommended by WHO is 60 gm; which is deficient in Pakistan i.e.12.2gm/head/day. The annual beef and mutton production is 1655 and 603 thousand tons. More over there is increasing demand of proteins due to surge of population but there is no specific meat breed in Pakistan.

According to the latest Economic Survey (2008-09), Buffaloes contributed over 50 per cent to local beef production and the population of buffaloes was 29.9 millions. An average of 2.15 million buffalo calves are born annually. The female calves are raised as replacement heifers, male calves either sold out at an early age (day old) and slaughtered or raised under low nutrition and management plan, resulting in high morbidity and diseases due to malnutrition. According to an estimate about 3.4 million cattle and 2.15 million

buffalo calves are born annually, if these are reared properly, 0.5 million tones of meat could be produced annually. The present study was designed to rear male buffalo calves on scientific feeding plan to attain the maximum weight at an early age and ascertain their fattening capabilities under various protein levels.

The livestock resources in our country are not being utilized properly; milch animals are not being fed on feed with proper nutrients and beef producing animals are being reared with considering the needed nutrients (Junejo, 2003). The present study was carried out to examine the beef production capabilities of male buffalo, calves, and fed on rations containing different crude protein (CP) levels. The fattening calves on diets with 14.1, 12.1 and 11.2% crude protein (Shin et al. 2002) and 13.7% CP (Ahmed and Jabbar, 2003) better beef production performance. Feeding cattle calves rations with 117,155 or 201 g CP/kg DM (Ahmed and Pollott, 2007) remained optimally profitable while calves reared for beef production. The higher weight gain in male calves may be obtained by providing around 10.42 MJ/kg of dietary metabolisable energy and about 10.22% of crude protein (Mahmoudzadeh et al. 2007). However, 19% CP has also been suggested by Neesse and Kirehgessner (2008) to get 750g daily weight gain in male cattle calves. Male Friesian cattle reach to daily weight gain upto 450 kg (Sadek et al. 1998) and 267 kg (Rana et al. 1999), 600 kg of Korean steers (Ahn, 2000), upto 556 g in Friesian heifers (Yee et al. 2000). The present proposal is therefore, designed to rear buffalo male calves on scientific feeding plan to attain the maximum weight at an early age and ascertain their fattening capabilities and nutritional qualities of meat under various protein levels.

MATERIAL AND METHODS.

Twelve male calves of Kundhi buffalo breed having average age of 12 months were experimented to examine their fattening capabilities subjected to different crude protein levels. The buffalo calves were randomly kept in groups namely; A, B, C and D, with 3 in each group. Feed containing 12, 14, 16 and 18 percent crude proteins was provided. The Crude Protein was balanced using cotton seed cake, mustard cake, rice polishing, wheat bran and maize crushed. The concentrates were given by mixing with dry fodder and green fodder. The nutrient requirements of calves were determined according to the standards of National Research Council (2001). The experiment was planned for two week's adaptation period and 90 days period of the study. The experimental animals were housed Livestock Experiment Station, Department of Livestock Management, Sind Agriculture University Tando Jam. At the arrival of buffalo calves, these were provided adaptation period of two weeks to acclimatize them with the environment. After completion of adaptation period, all the calves were individually weighed and their weight was considered as the initial body weight. The animals were kept off feed and water for 12 hours before recording their initial body weight. The observations regarding the body weight of each animal were carried out on every 7th day before feeding till the expiry of the experimental period of 90 days. After end of experiment, data was analyzed by the standard methods of Analysis of Variance and DMR test was also applied to test the significance between the means, using MSTAT-C Computer Software Package as per the statistical methods. All the experimental calves were provided Animal Health Coverage in terms of vaccination with four vaccines namely HSV, BQV, ASV & FMD against endemic diseases and de-worming with anthelmintics.

Feed Intake

Feed intake was gradually increased with the development of age of the calves. The calves fed ration containing 14 percent crude protein (Group-B) consumed more weekly feed (39.86) kg/animal), the consumption of Feed containing 12 percent CP (Group-A) was 39.01 kg/animal while calves in group-C consumed average weekly feed of 37.70 kg/animal. However, the minimum weekly feed consumption was recorded in case of calves in group-D (18% CP). It was noted that there was a simultaneous inverse affect with increasing CP levels and with increasing CP levels the feed consumption was considerably decreased as detailed in table-1 below:-

Table-1 Feed consumption of Kundhi buffalo calves by different CP levels (kg/calf/week).

Weeks	Groups			
	A	B	C	D
1.	27.22	27.90	25.14	24.70
2.	29.70	29.11	26.30	25.69
3.	30.52	30.23	28.33	28.46
4.	31.91	32.38	29.84	30.63
5.	33.41	34.25	32.03	32.32
6.	36.58	37.08	33.62	33.93
7.	38.84	38.97	34.93	36.30
8.	40.89	41.51	40.00	38.30
9.	44.34	44.10	42.00	39.99
10.	45.11	45.99	45.25	41.90
11.	47.07	49.06	47.92	44.77
12.	49.71	51.99	51.03	46.68
13.	51.89	39.86a	37.70b	36.37b

	Groups	Weeks
S.E.	0.3990	0.7194
LSD 0.05	0.8093	1.4589
LSD 0.01	1,0852	1.9563

Water intake

There was significant (P,0.01) effect of different CP levels on the intake of water by the fattening buffalo calves. The calves provided Ration-A (12% CP) took weekly water of 56.49 liters, while a marked increase in weekly water intake (61.33) liters) was recorded for calves fed on Ration-B (14% CP). A notable increase in weekly water intake was recorded in calves assigned Ration-C (16% CP) where the average weekly water intake reached 66.24 liters per animal. The maximum weekly water intake of 69.72 liters/animal was recorded in calves of Ration-D (18% CP). The daily average water intake of buffalo calves was 8.07, 8.76, 9.46 and 9.96 liters, in group-A, B, C and D, respectively. The calves consumed 45.10 liters water in the 1st week, which successfully increased to maximum weekly water intake of 86.73 liters taken by the fattening calves in the last week of the fattening program as detailed in table-2 below:-

Table-2 Water intake of Kundhi buffalo calves induced by different CP levels (liters/calf/week).

Weeks	Crude protein (%)			
	A	B	C	D
1.	42.88	44.84	45.63	47.04
2.	44.69	46.88	48.06	49.55
3.	46.57	49.16	50.65	52.37
4.	48.61	51.67	53.70	55.59
5.	50.72	54.41	57.00	59.19
6.	53.00	57.23	60.52	63.11
7.	55.43	60.21	64.37	67.42
8.	58.09	63.35	68.44	72.05
9.	60.92	66.56	72.83	76.99
10.	63.74	70.01	77.46	82.24
11.	66.80	73.70	82.32	87.73
12.	69.85	77.62	87.42	93.93
13.	73.07	81.61	92.67	99.57
Weekly	56.49d	61.33c	66.24b	69.72a
Daily	8.07	8.76	9.46	9.96

	Groups	Weeks
S.E.	1.3121	2.3654
LSD 0.05	2.6611	4.7973
LSD 0.01	3.5682	6.4327

Weight gain

The maximum weight of 6.13 kg was gained by the calves during last week of experiment. The effect of crude protein contents in fattening ration was highly Significant ($P < 0.01$). The calves fed on ration containing 12% CP gained minimum Weekly weight of 4.21 kg and calves given Ration-B(14% CP) gained 4.57 kg weight average in a week. Similarly, the calves fed on ration containing 16% CP resulted in maximum weekly weight gain of 4.95 kg; while the weekly weight gain was decreased to 4.74 kg with increasing CP concentration upto 18%. The average daily weight gain in calves fed on ration containing 12,14,16 and 18% CP was 0.60, 0.65, 0.71 and 0.68 kg, respectively with an average of 0.66 kg/calf. The differences in weight gain of calves fed on ration containing 16 and 18% CP rations were non-significant, suggested that the buffalo calves were capable to result economically higher beef production under 16% CP contained rations while 18% CP rations did not have economical viability in Kudhi buffalo calves subjected to fattening as elaborated in table-3, below:-

Table-3 Weight gain of Kundhi buffalo calves induced by different CP Levels (kg/calf/week)

Weeks	Groups			
	A	B	C	D
1.	2.86	2.83	2.98	3.06
2.	3.02	3.15	3.22	3.28
3.	3.30	3.48	3.48	3.50
4.	3.54	3.88	3.78	3.75
5.	3.76	4.05	4.14	4.06
6.	3.92	4.25	4.56	4.26
7.	4.14	4.25	4.98	4.66
8.	4.38	4.85	5.42	5.10
9.	4.68	5.25	5.86	5.50
10.	4.92	5.45	6.38	6.00
11.	5.18	5.65	6.34	6.54
12.	5.38	5.88	6.41	5.90
13.	5.70	6.09	6.75	5.96
WWG (kg/calf)	4.21c	4.57b	4.95a	4.74ab
DWG (g/calf)	0.60	0.65	0.71	0.68

	Groups	Weeks
S.E.	0.091	0.163
LSD 0.05	0.184	0.331
LSD 0.01	0.246	0.444

Feed efficiency

The effect of CP level on the fattening performance was highly significant, ($P < 0.01$). The calves fed on ration containing 12% CP had FCR up to 9.27 during 90 days experimental period, and calves fed on ration with 14% CP resulted in relatively improved FCR up to 8.76. The maximum feed efficiency, with 7.68 FCR was resulted by the calves fed on ration containing 16% CP during 90 day's experiment, while the calves fed on ration with highest CP concentration of 18% result FCR up to 7.74. The LSD test indicated that the differences in feed efficiency of calves fed on ration containing 14, 16, and 18% CP ration were non-significant, which concluded to the fact that the Kundhi buffalo calves were capable to give results of highest feed efficiency under 14 or 16% CP contained rations and CP level higher than 16% gave adverse effect on the fattening capability of calves due to higher feed consumption and relatively lower weight gain, as contained in table-4 below:-

Table-3 Feed conversion ratio of Kundhi buffalo calves as affected by different CP levels.

Weeks	Groups			
	A	B	C	D
1.	9.52	9.86	8.44	8.07
2.	9.83	9.24	8.17	7.83
3.	9.25	8.69	8.14	8.13
4.	9.01	8.35	7.89	8.17
5.	8.89	8.46	7.74	7.96
6.	9.33	8.72	7.37	7.96
7.	9.38	8.56	7.01	7.79
8.	9.33	8.56	7.38	7.51
9.	9.47	8.40	7.17	7.27
10.	9.17	8.44	7.09	6.98
11.	9.09	8.68	7.56	6.85
12.	9.24	8.84	7.96	7.91
13.	9.10	9.13	7.95	8.24
Average	9.27a	8.76b	7.68c	7.74c

	Groups	Weeks
S.E.	0.1218	0.2195
LSD 0.05	0.2470	0.4453
LSD 0.01	0.3312	0.5971

Table-5 Economics of rations containing different CP levels as observed with market rates of 2008-09

Sr.#	Particulars	A	B	C	D
		Groups			
1	Dry fodder in 90 days (kg/calf)	360.00	360.00	360.00	360.00
2	Rate of dry fodder (Rs/kg)	4.00	4.00	4.00	4.00
3	Amount of dry fodder (Rs/calf) AxB	1440.00	1440.00	1440.00	1440.00
4	Green fodder in 91 days (kg/calf)	360.00	360.00	360.00	360.00
5	Rate of green fodder (Rs/kg)	2.00	2.00	2.00	2.00
6	Amount of green fodder (Rs/calf)DxE	720.00	720.00	720.00	720.00
7	Concentrate (kg/calf)	90.00	112.50	126.45	144.00
8	Rate of conc (Rs/kg)	19.00	19.00	19.00	19.00
9	Amount of concentrate (Rs) GxH	1710.00	2137.00	2402.55	2736.00
10	Total feed cost/calf (Rs) C+F+I	3870.00	4297.00	4562.55	4896.00
11	Cost of medication/Vaccination (Rs)	225.00	225.00	225.00	225.00
12	Rabour cost (Rs)	750.00	750.00	750.00	750.00
13	Miscellaneous Cost (Rs)	500.00	500.00	500.00	500.00
14	Initial cost of Calves (Rs)	6380.00	6719.90	6465.80	6820.00
15	Total costs (J+K+L+M+N)	11725.00	12492.00	12503.35	13191.00
16	Weight gain kg/calf in 91 days	54.78	59.36	64.29	61.56
17	Initial weight (kg/calf)	58.00	61.00	59.00	62.00
18	Total weight (kg/calf)	112.78	120.36	123.29	123.56
19	Sale of calves (Rs)	12405.00	13249.50	13537.70	13591.60
20	Net profit S-O (Rs)	680.00	757.10	1034.35	400.60

DISCUSSION

The beef production performance of buffalo calves was significantly ($P>0.01$) improved by increase in the CP levels; 16% gained 79.19 kg weight with FCR of 6.07. The average daily weight gain of the 80 calves fed on 12, 14, 16 and 18% CP ration was 524, 635, 870 and 902 grams / animal. The calves in group C, where they were fed ration containing 16% CP had remarkably better beef production capabilities as compared to those fed on experimental rations containing 12, 14, or 18% CP levels. It was also noted that each increment in CP level in feed resulted significant improvement in growth of calves, but CP level beyond 16% did not show economical results. Moss and Goodchild (2001) suggested 16-18% CP for fattening heifers, while Moss and Murray (2002) recommended 14% CP in ration for cattle calves fattening (Ahmed and Jabbar, 2003). The fattening calves on diets with 14.1, 12.1, and 11.2% crude protein (Shin et al. (2002) and 13.7% CP (Ahmed and Jabbar, 2003) performed better beef production performance. Feeding of cattle calves with the ration 117, 155 or 201 g CP/kg DM (Ahmed and Pollott, 2007) remained optimally profitable while calves reared for beef production. The higher weight gain in male calves may be obtained by providing around 10.42 MI/kg of dietary metabolisable energy and about 10.22% of crude protein (Mahmoudzadeh et al. 2007). However, 19% CP has also been suggested by Neesse and Kirchgessner (2008) to get 750 g daily weight gain in male cattle calves. The above results are in concurrence with the findings of Ferreiro and Preston (2003) reported live weight gain of 630 g per day. Ruangprim et al. (2003) recorded body weight of fattening cattle calves upto 400 kg, while Alvarez and Preston (2004) reported 734 g per day weight gain in fattening calves. Similarly, Dimov and Tzankova (2004) obtained 500 kg weight of fattened bullocks; while Fundora et al. (2004) reported 706g of average daily gain in fattening cattle calves. Lapitan et al. (2004) reported average daily weight gain upto 1066.1 g, while Boatto et al. (2005) achieved 400 g of average daily gain in heifers. Ahmed and Pollott (2007) reported average daily weight gain upto 850 gm in fattening calves, while Baran et al. (2007) got upto 800 g daily weight gain in cattle calves. Considerable research on the similar aspects has been conducted and reported through various research journals. Sadek et al.(1998)reported that male Friesian cattle reached to weight gain upto 450 kg and Rana et al. (1999) reported final body weight of 267 kg, but Ahn (2000) reported 600kg final body weight of Korean steers; while Yee et al. (2000) reported per day weight gain upto 556 g in Friesian heifers. Yaylak and Kaya (2001) used Holstein-Friesian calves for fattening which resulted final weight of 425-450 kg within 10-12 months. Moss and Murray (2002) achieved growth rates of 700 g per day in cattle calves fattening trial, while Restle *et al.* (2002) obtained average daily live weight gain of 1.375 kg. The above reviewed work discussion clearly shows that the findings of the present study are well comparable with most of the studies reported. It is worth to suggest that feed and feeding patterns may be analysed critically and fattening programs may be formed under the expertise supervision of animal nutritionists.

Conclusions

- With increasing CP level, the buffalo calves reduced the feed consumption and increases water intake.
- The Weekly weight gain, FCR and net profit was better in group C (16% CP) among all the groups.

- Increasing CP in ration up to 18% showed no significant affect on the calf growth and was un-economical.

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CHEMICAL COMPOSITION AND NUTRITIVE VALUE OF SUMMER FORAGES OF IRRIGATED AND ARID ZONES OF KARACHI DIVISION

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ABSTRACT

A study was designed to determine the chemical composition and nutritive value of naturally growing summer forages (legumes and non-legumes) in irrigated and arid zone areas of Karachi Division. The samples were collected at pre-flowering stage once from various twenty areas, at random and weighed on fresh basis. Each sample was dried, weighed and milled for proximate analysis such as Crude Protein (CP), Crude Fiber (CF), ash, Ether Extract (AE), Nitrogen Free Extract (NFE), calcium, and phosphorus. The calculations were made for their nutritive value such as; DMD, TDN DE and ME for cattle and sheep, respectively. The results indicated that leguminous forages were rich in CP and EE and also in TDN, DE and ME for cattle and sheep than non-legumes forages. (4.1 and 2.3:2.5 and 1.3;50 and 45;2.2and 1.9;2.2 and 2.1 and 1.8 and 1.5 and 1.8 and 1.7 percent), respectively. However non-legume was rich in crude fibre (27.4% P=0.05 Irrigated and arid zone areas had no significant influences in qualitative analysis. however arid zone forages had more dry matter and ether extract, than the forages collected from irrigated areas (21.8 and 29.7 percent, P=0.06 and 1.6 and 2.3 percent, P0.06), respectively, while TDN was higher for arid zone forages than irrigated (49.4 and 46.0 percent, P<0.05). Interaction between legume/non-legume forages and irrigated arid zone areas were not different statistically (P>0.05). Crude proteins had strong positive correlation with ether extract (0.417), while DM and ash (-0.463), CF with ash (-0.5 18) and NFE (-0.377), ash with NFE and moisture with NFE (-0.38) had negative, correlations. It was concluded that forages of arid zone areas contained more dry' matter and ether extract than irrigated area and legume forages were rich in crude protein and ether extract but poor in crude fiber. Furthermore, the chemical composition results of various forages may be useful by adding them in ruminant feeds for enhancing livestock productivity.

Key Words: Chemicals Composition Summer Forages Karachi - Pakistan.

INTRODUCTION

Most of our animals are producing below their genetic worth mainly due to shortage of feed. The area of Pakistan is 79.61 million hectares out of which 20 million hectares are cultivated. The cropped area provides only 1/3rd of total feed nutrients, the rest coming from crop residues, flood plains, range lands and road side canal bank grazing. However, most of animals are still low producers due to deficient supply of the nutrients in Pakistan, (Ajmal, 1990). National Commission on Agriculture, Pakistan (Anonymous, 1988) reported that the aggregate availability of fodder, crop residues, range and concentrate relative feed for total livestock units is about 70 percent of optimum requirements. This position is even below in Sindh province (Isani and Qaimkhani, 1992). There is an estimated annual shortage of Total Digestible Nutrients by 30 percent of the total requirement for 16.4 million heads of livestock.

The shortage of digestible protein is attributed to the fact that amount of feed and fodder which animals consume, falls short of their appetite in volume. The quality of feed is poor,

due to that animals are producing less than their capabilities. Various studies have indicated that presently our livestock is being provided feed and fodder to the level of less than 70 per cent of their appetite. If the missing 30 percent is also made available, the milk production could be doubled without changing the number of animals. The indigenous feed resources can be explored to increase availability of animal feed, (Naim, 1992). Both the quantity of animal feeds and their quality are the most important components of animal production.

The quality of forage depends on multiple factors viz, species, climate and soil, however for animal ration formulation, the feed's chemical composition is needed. Evaluating various livestock feed stuffs may employ a number of different parts for various nutrients. However, there are direct analytical methods by which we can determine that how rich feed stuffs are in various nutrients (Church, 1986). Qualitative fodders have an outstanding role in the efficient livestock production and efforts are being made to evaluate high yielding varieties of common fodder. However, it will be more useful when their nutritive values are known. (Anjum *et al* 1985). Legumes are good source of protein, carbohydrates, dietary fiber, vitamins and minerals. However they are low in fat, sodium and anti-nutritional substances. Forage feeds had also good fibre and energy source, those can be utilized to produce livestock products economically, and also fill the gap of feeding requirements of livestock. (Anjum *et al* 1985).

Pozy *et al.* (1995) collected and analyzed samples of natural grasses, cultivated grasses, legumes, grass silage and agro-industrial residues for dry matter, crude protein, crude fibre, fat, ash, calcium and phosphorus in Burundi. They reported that natural grasses contained dry matter, 34 and crude protein 30.38, 7.5, crude fiber 37; ash, 4.2; calcium, 0.13 and phosphorus 0.11 per cent of dry matter. Cultivated grass contained 15.26 dry matter, 7.10, crude protein, 30.38, crude fibre, 8 to 16 ash; 0.22 to 0.66 calcium and 0.1 to 0.3 percent phosphorus, respectively and legumes containing dry matter 24.4 to 35.4, crude protein 20.6 to 32.2; ash 4.8 to 7.7; calcium 0.56 to 1.30, and phosphorus 0.15 to 0.18. Furthermore, indicated that feed stuff of plain area contained significantly higher dry matter, ash and crude protein, while highland grown feed stuff were rich in crude fibre and calcium. Serra *et al.* (1995) studied para and star grasses during various months during wet and dry seasons in Philippines. They reported that months had significant influence for CR and various fibre fractions, furthermore crude protein and hemicellulose were more during rainy period and NDF, ADF, ADL and CE were at peak in dry period of the year. Mineral Ca, K, Cu, and Zn, contents were at peak in dry season. Positive correlations were determined between rainy season to CP, cellulose and phosphorus but negative correlation with rest of the fiber fractions and mineral contents respectively.

Material and Methods

The samples of forages (legumes and non- legumes) at pre-f lowering stage were randomly collected during the summer season in the year 2010. Twenty places of Karachi division were selected from irrigated and arid zone areas for collection of samples. The list of irrigated and arid zone areas of Karachi Division were; Ansari Farm, Along the Supper Highway, National Highway, Malir River (Side), Dabeji, Rinpatyani, Choolhar, Cattle

Colony, Goth Ghulam Mohammad, Budani Goth, RCD. Highway, Goth Au Mohammad, Goth Jan Mohammad, Goth Wangi, Mangho Pir, Liyari River (side), Surjani Town, Lasi Goth, Hub River and Gadap areas.

Collection of Samples.

The available forage samples were harvested by using scissor, 2 cm above the ground level. Samples were weighed on fresh basis and were initially stored into the polythene bags duly, were brought to the Animal Nutrition laboratory, Sindh Agriculture University, Tandojam, for analysis. The calculative methodology for DM, Ash, CF, CP, TDN, etc were adopted as detailed in A.O.A.C-1994.

Drying: Each sample was air dried then dried in the hot air oven at 55°C-60°C for 5 hours (A 1980) and finally weighed.

Dry Matter: Dry matter of forage samples were determined by using the initial weight (fresh) and final weight (dried) by using the equation detailed in AOAC-1994.

Grinding: The samples were chopped with scissor to bring them to small size then milled by using the grinder machines , to one mm + sieved.

Ash: Dried and milled sample (1 mm) by a mill, weighed 2 g of each into crucible and kept into the muffle furnace at 600°C for at least 6 hours and cooled in dessicator and weighed. Ash content of the samples were determined by the methodology detailed in (A.O.A. C, 1994).

Crude Protein: Nitrogen in each sample was determined in duplicate by micro Kieldahl procedure (A.O.A.C., 1994). Each dried and milled (1 mu) sample, weighing 2g was put into Kieldahi flask (650 ml), added the catalyst, then added 25 ml H₂S₀₄ concentration and digested and finally Nitrogen was detonated by distillation and titration. Crude protein in the sample was calculated accordingly.

Crude Fiber: 2 g of dried and milled sample (1 mm) taken in to a 600 ml long beaker, then added 200 ml H₂S₀₄ (1.25 %) and adjusted temperature of crude fiber extraction apparatus for half an hour. The sample was filtered and the residue washed with water free of acids. The acid free residue transferred into other beaker and added 200 ml of NaOH (1.25 %) and boiled (digestion) for half an hour, washed with boiled distilled water free of alkali. The sample was transferred into a crucible and dried into hot air oven at 100°C for 30 minutes to constant weight. The sample kept in crucible for ignition of crude fiber in muffle furnace at about 600°C for 6 hours till ash formation. Samples were collected into dessicator and finally weighed. Loss in the weight was determined accordingly.

Nitrogen Free Extract: NFE was determined by subtracting the sum of crude protein (percent), crude fiber (percent), ether extract (percent) and total ash content (percent) from 100 as given formula.

$$NFE\% = 100 - (CP\% + CF\% + EE\% + ASH\%)$$

Calcium: Calcium was determined by flame photometer. A sample of 0.05g of ash was digested with 10 ml of 2N HCl over night, was filtered, then 10 ml aliquot from acid digested filtrate was taken in 100 ml volumetric flask and was made to 100 ml. Then 50 ml aliquot was taken in 250 ml volumetric flask and was made to volume 250 ml. Then obtained the instrument reading for standard solution with the wave length indicator set at the point corresponding to calcium emission maximum at 6,220 Å, and calculation was made accordingly.

Determination of Phosphorus: Ash obtained from ignition of 2 g sample was added in 150 ml beaker and placed for 4 hours at 600°C then it was cooled, 40 ml, HCl solution (1 volume of HCl mixed with 3 volumes of H₂O) and several drops of HNO₃ were added and brought to boiling point it was again cooled and transferred to 200 ml volume flask and diluted to volume with H₂O. The solution was filtered and aliquot containing 0.3 - 1.5 mg P was placed in 100 ml volumetric flask, 20 ml molybdovanadate reagent was added and diluted to volume with H₂O and mixed well. The solution was let to stand for 10 minutes, then percent transmission was read on spectrophotometer, at 400 nm against 0.5 mg standard set at 100 per cent transmission phosphorus was determined from standard curve.

Total Digestible Nutrients: Estimation of total digestible nutrient was determined using the following regression equation for ruminants (cattle and sheep) as suggested by Minson (1988).

Digestible Energy and Metabolizable Energy: For estimation of digestible energy the method recommended by Minson (1988), both for large and small ruminants (i.e. cattle and sheep) was used as under. DE (Mcal/kg) TDN % / 0.04409

ME was also calculated through the following regression equation derived by Minson (1988). ME (Mcal/kg) = TDN % / 27.65

Dry Matter Digestibility: Dry matter digestibility percentage was calculated by using regression equation derived and recommended by Minson (1988). DMD (%) 84. -0.94 CF.

RESULTS.

Forty two forages were collected from twenty randomly selected areas of Karachi division and classified into legume 16 and non-legume 26 per irrigated and arid zone areas, respectively.

Dry Matter: Non-legume forages contained slightly more dry matter per cent than legume forages, however, the difference was not significant ($P > 0.05$; Table-I). The dry matter content ranged from 6.1 to 83.3 with mean 27.5 ± 12.8 per cent. Forages collected from the arid zone area contained more dry matter per cent than the forages of irrigated area ($P < 0.10$; Table-I). The interaction between legume / non-legume and irrigated / arid zone forages for dry matter content (%) was not different significantly. Furthermore, legume forages of irrigated area had minimum dry matter content while non-legume from arid zone had maximum content of dry matter per cent ($P > 0.10$) as shown in Table-1.

Table-1. Dry matter of legume and non-legume, irrigated and arid zone forages (%) in Karachi division.

Items	Legume	Non-legume	SED	Probability
Dry Matter	22.75 ± 03.191	28.74 ± 2.625	4.369	0.156
Irrigated and arid zone forages	21.75 ± 3.337	29.74 ± 2.437	4.369	0.061
Interactions ; Irrigated zone	16.84 ± 5.045	26.67 ± 4.369	5 526	0 358
Arid zone	28.67 ± 3.908	30.81 ± 2.913		

Crude Protein: The results indicated that legume forages contained significantly higher crude protein per cent than non-legumes ($P < 0.01$; Table-2). Crude protein content of various forages belonged to irrigated and arid zone was not different significantly ($P > 0.10$, Table-2). Furthermore, the interaction between Legume / non-legume and irrigated/arid zone forages showed that crude protein per cent was not different significantly ($P > 0.01$, Table-2). The crude protein content of the collected forages of Karachi division ranged from 0.82 to 7.14 with mean 2.98 ± 1.51 per cent.

Table-2. Crude protein of legume and non-legume, irrigated and arid zone forages (%) in Karachi division.

Items	Legume	Non-legume	SED	Probability
Crude protein	4.08 ± 0.333	2.25 ± 0.274	0.389	0.000
Irrigated and arid zone forages	3.18 ± 0.348	3.15 ± 0.254	0.398	0.945
Interactions; Irrigated zone	4.38 ± 0.526	1.98 ± 0.456	0 576	0 192
Arid zone	3.78 ± 0.408	2.52 ± 0.304		

Crude Fiber: The crude fiber content of non-leguminous forages was significantly higher than leguminous forages ($P < 0.05$; Table-3). Crude fiber contents of forages of irrigated and arid zone areas were not significantly different ($P > 0.10$) as shown in Table-3. Furthermore, the interaction between legume / non-legume and irrigated / arid zone area for crude fibre per cent was not different significantly ($P > 0.10$) as appears in Table-3. The crude fibre contents of various forages ranged from 12.5 to 37.0 with mean 25.67 ± 6.98 per cent.

Table-3. Crude fiber of legume and non-legume, irrigated and arid zone forages (%) in Karachi division.

Items	Legume	Non-legume	SED	Probability
Crude fiber	22.82 ± 1.769	27.39 ± 1.456	2.114	0.053
Irrigated and arid zone forages	24.46 ± 1.850	25.75 ± 1.351	2.114	0.577
Interactions ; Irrigated zone	20.83 ± 2.797	28.09 ± 2.422	2 990	0250
Arid zone	24.80 ± 2.160	26.70 ± 1.615		

Ash: The ash per cent of legume forages was not significantly different from non-legume ($P > 0.10$; Table-4). Similarly irrigated and arid zone grasses was not different significantly for ash per cent ($P > 0.10$) as available in Table-4. The irrigated and arid zone forages was not different significantly for ash per cent ($P > 0.10$). The interaction between legume / non-legume and irrigated / arid zone forages for ash per cent was also non-significant

($P>0.10$) as detailed in Table-4 below. However, ash content of various forages was ranged from 7.3 to 41.9 with overall mean 16.75 ± 768 percent.

Table-4. Ash of legume and non-legume, irrigated and arid zone forages (%) in Karachi division.

Items	Legume	Non-legume	SED	Probability
Ash	17.93 ± 2.033	16.41 ± 1.673	2.430	0.568
Irrigated and arid zone forages	18.19 ± 2.126	16.15 ± 1.553	2.430	0.443
Interactions; Irrigated zone	19.65 ± 3.214	16.73 ± 2.784	3.522	0.599
Arid zone	16.21 ± 2.450	16.09 ± 1.856		

Ether Extract: Legume forages contained more ether extract than non-legume and their difference was statistically significant ($P<0.01$) as appears in Table-5. Furthermore, forages of arid zone contained significantly more ether extract than irrigated forages ($P<0.01$) as detailed in Table-5. Interaction between legume / non-legume and irrigated / arid zone grasses for ether extract per cent were not statistically significant ($P>0.10$) as detailed in Table-5. The ether extract of forage content ranged from 0.2 to 5.0 with overall mean 1.89 ± 1.213 per cent.

Table-5. Ether extract of legume and non-legume, irrigated and arid zone forages (%) in Karachi division.

Items	Legume	Non-legume	SED	Probability
Ether extract	2.547 ± 0.267	1.328 ± 0.220	0.3 19	0.001
Irrigated and arid zone forages	1.600 ± 0.280	2.274 ± 0.204	0.3 19	0.058
Interactions; Irrigated zone	2.083 ± 0.422	1.117 ± 0.365	0.462	0.469
Arid zone	3.010 ± 0.327	1.539 ± 0.243		

Nitrogen Free Extract: Nitrogen free extract content was not statistically different for legume and non-legume ($P>0.10$) as shown in Table-6, irrigated and arid zone ($P>0.10$) available in Table-6, respectively. Furthermore, the interaction between legumes / non-legume and irrigated / arid zone forages was non-significant ($P>0.10$). Generally, the nitrogen free extract ranged from 38.33 to 71.12 with overall mean 52.58 ± 7.14 per cent.

Table-6. Nitrogen free extract of legume and non-legume, irrigated and arid zone forages (%) in Karachi division.

Items	Legume	Non-legume	SED	Probability
Nitrogen free extract	52.48 ± 1.912	52.54 ± 1.573	0.285	0.979
Irrigated and arid zone forages	52.52 ± 1.999	52.50 ± 1.460	0.285	0.995
Interactions; Irrigated zone	52.95 ± 3.022	52.09 ± 2.619	3.311	0.709
And zone	52.01 ± 2.341	53.00 ± 1.745		

Minerals: Generally the legume forages were rich in calcium and poor in phosphorus followed by non-legume forages. Legume forages had more calcium and phosphorus than non-legume forages, however, the difference was not statistically significant, (Table-7).

Similar trend was noticed for irrigated and arid zone forages for their calcium and phosphorus content, (Table-8). The interaction between legume / non-legume and irrigated / arid zone forages for their calcium and phosphorus contents were not different statistically ($P>0.01$) and ($P>0.10$) as detailed in Table-7. The calcium content of various forages ranged from 25000 ppm to 1555000 ppm with overall mean 289257 ± 303985 ppm and phosphorus content ranged from 3153 to 1629029 ppm with overall mean 88954 ± 276459 ppm

Table-7. Calcium of legume and non-legume, irrigated and arid zone and in Karachi division.

Items	Legume	Non-legume	Probability
Calcium	343633 ± 79734	245271 ± 65609	0.347
Irrigated and arid zone forages	300380 ± 8333880	280523 ± 60898	0.909
Interactions; Irrigated zone	409003 ± 126070	191757 ± 109180	0.257
Arid zone	278263 ± 97654	298784 ± 72787	

Table-8. Phosphorus of legume and non-legume, irrigated and arid zone forages (ppm) in Karachi division.

Items	Legume	Non-legume	Probability
Phosphorus	25739 ± 69082	173108 ± 56845	0.108
Irrigated and arid zone forages	157479 ± 72248	41368 ± 52763	0.202
Interactions ; Irrigated zone	$23165 \pm 10,229$	291793 ± 94595	0.183
Arid zone	28313 ± 84608	54423 ± 63063	

Correlation Coefficient: Crude protein had strong positive correlation with ether extract (+0.463) while dry matter and ash (-0.463) crude fiber with ash (-0.518) and nitrogen free extract (-0.377), ash with nitrogen free extract (-0.545) and moisture with nitrogen free extract (-0.39) had negative correlation as appear in table-9, below.

Table-9. Correlation coefficient of various parameters.

Items	DM	CP	CF	Ash	EE	Moist	NFE	Ca
CP	-0.128	-	-	-	-	-	-	-
CF	0.132	-0.093	-	-	-	-	-	-
Ash	-0.463	-0.008	-0.518	-	-	-	-	-
EE	0.150	0.417	-0.191	-0.074	-	-	-	-
Moist	-1.000	0.128	-0.132	0.463	-0.150	-	-	-
NFE	0.380	-0.186	-0.377	-0.545	-0.003	-0.380	-	-
Ca	-0.059	0.095	-0.227	0.018	0.067	0.059	0.168	-
P	-0.028	-0.180	0.188	0.009	-0.261	0.028	-0.107	0.109

Dry Matter Digestibility: Legumes / non-legume and irrigated / arid zone forages had no influence to their level of dry matter digestibility (Table- 10), furthermore interaction between legume / non-legume and irrigated / arid zone also had non-significant difference for dry matter digestibility (Table-10). The total digestible nutrients of forages ranged from 49.72 to 72.75 (mean 60.61 ± 6.47) percent.

Table-10. Dry matter digestibility (%) of legume and non-legume, irrigated and arid zone forages in Karachi division.

Items	Legume	Non-legume	SED	Probability
Dry matter digestibility	3.05 ± 1.655	59.37 ± 1.362	19.763	0.094
Irrigated and arid zone forages	62.13 ± 1.731	60.20 ± 1.264	19.763	0.397
Interactions; Irrigated zone	64.92 ± 2.617	59.35 ± 2.267	2.730	0.383
Arid zone	61.19 ± 2.027	59.40 ± 1.511		

Total Digestible Nutrients: Leguminous forages contained significantly more total digestible nutrients than non-leguminous forages ($P < 0.01$) and arid zone forages also found significantly rich in total digestible nutrients ($P < 0.05$; Table-11). The interaction between legume / non- legume and irrigated / arid zone for total digestible nutrients showed non-significant difference, however, arid zone legume forages had maximum total digestible nutrients and irrigated non- legume forages had minimum total digestible nutrients, (Table-11). Total digestible nutrient ranged from 38.1 to 59.6 (mean 47.7 ± 5.1) percent.

Table-11. Total digestible nutrients (%) of legume and non-legume, irrigated and arid zone forages in Karachi division.

Items	Legume	Non-legume	SED	Probability
Total digestible nutrients	50.25 ± 1.115	45.06 ± 0.918	1.333	0.001
Irrigated and arid zone forages	45.97 ± 1.166	49.61 ± 0.852	1.33	30.024
Interactions; Irrigated zone	49.3 ± 1.764	42.61 ± 1.527	1.842	0.297
Arid zone	51.18 ± 1.366	47.52 ± 1.018		

Digestible Energy (DE): The estimated results of (DE) for cattle indicated that legume forages were rich in DE than non-legume forages but the difference was not significant for irrigated and arid zone forages (Table-12) and also for interaction between legume / non-legume and irrigated land zone forages (Table-11). Similar responses were recorded for estimated digestible energy for sheep.

Table-12 Digestible energy for cattle in legume and non-legume, irrigated and arid zone forages and in Karachi division (M cal/kg)

Items	Legume	Non-legume	SED	Probability
Digestible energy for cattle	2.216 ± 0.057	1.948 ± 0.047	0.068	0.001
Irrigated and arid zone forages	2.027 ± 0.060	2.137 ± 0.044	0.068	0.145
Interactions; Irrigated zone	2.175 ± 0.0901	1.829 ± 0.078	0.094	0.705
Arid zone	2.257 ± 0.070	2.016 ± 0.052		

Table-13 Digestible energy for sheep in legume and non-legume, irrigated and arid zone forages Karachi division (M cal/kg)

Items	Legume	Non-legume	SED	Probability
Digestible energy for cattle	2.178 ± 0.046	2.056 ± 0.038	0.055	0.047
Irrigated and arid zone forages	2.093 ± 0.048	2.141 ± 0.035	0.055	0.422
Interactions; Irrigated zone	2.169 ± 0.073	2.016 ± 0.063	0.076	0.614
Arid zone	2.187 ± 0.057	2.095 ± 0.042		

Metabolize able Energy (ME): Leguminous forages were rich in ME available for cattle than non-leguminous (Table-14), however estimated metabolically energy level was not significantly different for irrigated and arid zone forages (Table-14) and also for the interaction between legume non-legume and irrigated arid zone forages. Similarly ME content estimated for sheep in leguminous forages were rich than non-leguminous (Table-15). Furthermore, result of estimated metabolically energy for sheep showed no significant difference for irrigated and arid zone forages the interaction between legume/non-legume and irrigated/arid zone forages (Table-14).

Table-14. Metabolize able energy for cattle in legume and non-legume, irrigated and arid zone forages in Karachi division (M cal/kg).

Items	Legume	Non-legume	SED	Probability
Digestible energy for sheep	1.818 ± 0.047	1.528 ± 0.039	0.056	0.001
Irrigated and arid zone forages	1.663 ± 0.049	1.753 ± 0.036	0.056	0.145
Interactions; Irrigated zone	1.784 ± 0.074	1.541 ± 0.064	0.078	0.706
Arid zone	1.851 ± 0.057	1.654 ± 0.043		

Table-15. Metabolizable energy for sheep in legume and non-legume, irrigated and arid zone forages in Karachi division (M cal/kg).

Items	Legume	Non-legume	SED	Probability
Digestible energy for sheep	10787 ± 0.038	1.686 ± 0.031	0.046	0.047
Irrigated and arid zone forages	1.717 ± 0.040	1.756 ± 0.029	0.046	0.422
Interactions; Irrigated zone	1.779 ± 0.060	1.654 ± 0.052	0.063	0.613
Arid zone	1.794 ± 0.046	1.719 ± 0.035		

Discussion:

It is concluded that forages of arid zone area contained more dry matter and ether extract than irrigated area and legume forages were rich in crude protein and ether extract but poor in crude fiber. Furthermore, the chemical composition results of forages may be useful by adding them in ruminant feeds for maintenance and production purposes. The results may also be transferred to end users / farmers of concerned areas and also feed technologists to improve the nutritional status of Livestock by utilization of unexploited feed / forage resources.

Results of this study are in agreement with the findings of Rind (1984), who reported that *Typha angustifolia* plant and *Cynodon dactylon* of Nara canal contained 23 and 32 per cent dry matter respectively and are also in agreement with Laghari (1992), who reported that forages of Hyderabad division in their pre-flowering stage contained 10 to 45 per cent dry matter. Furthermore, Pozy *et al.* (1995) reported that grasses grown in natural condition were contained upto 34 percent dry matter. The results of present study are in line with the results of Laghari (1992) that the crude protein was more in leguminous forages than non-leguminous forages. However, legumes contained upto 20 per cent CP that may be due to the different species of forages.

Bonomi *et al.* (1988), Naidenov and Damyanova (1988) reported that the forages in various harvests resulted different levels of CF content however, the forages under harvest may be in various stages of growth or systems of cultivation i.e. irrigated.. However, the CF content ranged from 20 to 30 per cent.

Ash content of forages reported under this study is in full agreement with Laghari (1992), whose study area as Hyderabad division. Furthermore, he analyzed 53 forages and found that their ash content ranged from 5 to 29 per cent. However, Pozy *et al.* (1995) studied wide range of grasses and agro-industrial by products in Burundi, whose results indicated less ash content. The results of this study are almost in agreement with Anjum *et al.* (1985) and Farooq *et al.* (1989) although the locations of their studies were Bahadurabad and Peshawar, respectively. However Farooq *et al.* (1989) analyzed twelve range grown grasses and found that they contained crude fat 1.7 to 4.1 per cent.

Anjum *et al.* (1985) reported that Sadabahar grass at Bahadurabad, Puniab contained 45 to 53 per cent NFE, while under present study forages of Karachi division, contained wider range of NFE (71 per cent). It may be due to their age factor.

Results under this study are not in agreement with Pozy *et al.* (1995) for Ca and phosphorus contents of animal feeds. It may be due to difference in the soil and irrigation water under use which come from underground and drainage of Metropolitan, Karachi. Furthermore the irrigated and arid zone areas under study had no influences for mineral contents that may be due to late maturity for grown grasses which can get sufficient quantity of minerals.

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have been reported for certain Pakistani sheep breeds; but little information is available on wool of well known sheep breeds of AJ&K. In this paper complete analysis of wool of AJ&K sheep breeds is discussed.

MATERIAL AND METHODS

One hundred wool samples of each breed were collected for wool analysis of four sheep breeds found in Azad Jammu & Kashmir. Samples of wool were obtained from the farmer's private flocks in the respective areas of the breed habitation. Experimental sheep were randomly selected from each flock. Only adult sheep were sampled by assuring that they were two – tooth or above in age, Mid side wool samples were collected from each sheep using the following procedure as described by Khan et al., 1994:-

- (1) Over 60 gram of wool samples were obtained from left mid-side of sheep. Samples were taken from the same site on all animals to ensure the consistency of results. Location of mid-side was ascertained by measuring of full hand span from back bone down the last rib. The sample was clipped using the electric clipper. A second cut was carefully avoided.
- (2) The samples were immediately placed in a polythene bag, along with an identification tag, secured at top by a rubber band, for later analysis in the laboratory.
- (3) The bags were also marked for sample identification using a black felt marker.
- (4) Collected wool samples were transferred to wool laboratory of Small Ruminants Research Program, Animal Sciences Institute, National Agricultural Research Centre (NARC) Islamabad, for analysis.

WOOL ANALYSIS PROCEDURES

Measurement of clean wool yield (%): For estimation of clean wool yield, standard procedure of National Agricultural Research Centre laboratory was adopted. Each mid-side fleece sample was weighed on an electronic scale, and was then manually carded and placed in a scouring bag. For identification, these scouring bags were labeled with scouring tags. Wool samples were placed in scouring unit. The standard laboratory scouring unit consisted of four bowls, each with capacity of 72 liters. The bowls were fitted with thermostatic gas heaters. 20 wool samples were used for scouring one time.

Table 1. Composition & Temperature of Aqueous Scouring Liquors (Bowl capacity = 72 liters).

Ingredient	Bowl 1	Bowl 2	Bowl 3	Bowl 4
Chemirite Ni 400 (ml)	120	80	40	--
Sodium Chloride (g)	150	--	--	--
Water (Liter)	72	72	72	72
Temperature (C)	70	70	70	45

Once the bowls were filled with required amount of water (72 liters) with required temperature in each bowl as mentioned above, detergent, Chemirite Ni 400 was added in each bowl, in required amount. NaCl (Sodium Chloride) 150g was also added in bowl 1. Starting from bowl 1, the sample was retained in each bowl for 25-30 minutes and passed through the manual wringer while transferring to the next bowl. Samples were stirred manually. After Scouring, the sample was placed in a dryer for three minutes and was then dried in the forced air oven at 50°C for 12 hours. Weight of dried samples was recorded.

The percentage clean wool yield was calculated using the following formula :-

$$\text{Yield} = \frac{W2}{W1} \times 116$$

W1= weight of greasy fleece sample (g).

W2= weight of oven dried scoured sample (g)

Factor 116=A moisture regain of 16 percent.

Measurement of Fiber Fineness / Diameter (u): A newly developed instrument called Optical Fibre Diameter Analyzer (OFDA) was used for the measurement of fibre fineness. The use of OFDA is the latest and fastest method developed for the measurement of fibre diameter. For the measurement of fibre diameter by OFDA, the wool sample under test was placed in a standard atmosphere condition (20+2°C temperature and 65 + 2% relative humidity) for 24 hours. The sample was then placed in a machine, called Minicore, which is operated by pressure and 1.8 to 2.0mm snippets (wool sample consisted of short lengths of fibre called snippets) were cut. These snippets were placed in the agitator, so that they will be spread on glass slide equally. As the fibres were spread on the glass slide, it was prepared for the analysis of mean fibre diameter along with standard deviation (SD) by OFDA. This slide was placed under the OFDA camera for measuring fibre diameter. A video camera is attached, together magnified images of short fibre snippets. Image analysis software is run on a Personal Computer (PC), which selects and measures the snippets, and calculates fibre diameter. More than 2000 snippets can be measured in less than one minute (it would take about half a day on the manual projection microscope).

The OFDA is believed to be faster than the airflow method, and should be more accurate over the whole range of wool types. The PC monitor exhibits the result in form of both mean and distribution of fibre in a sample. The OFDA gives a reading of the average fibre diameter in microns and shows the variability of the fibres as standard deviation of the fibre fineness and by a graph. The OFDA is equally well suited to measure fine wool and coarse wool.

Measurement of Staple Length (cm): The sample length of wool samples was measured using a ruler fixed on a black velvet covered board. The staple was straightened along the ruler after carefully adjusting its base to the Zero mark on the ruler. Staple was taken randomly from each fleece sample and subjected to measurement using ruler. This procedure was repeated three times for each individual sample to calculate mean and standard deviation (SD) values of staple length. Measurement of staple length is helpful in producing good quality yarn.

Measurement of Wool Bulk (cm³/g): Bulk is the volume of a sample fills under a given compression and is expressed in cubic centimeters per gram (cm³/g). An instrument called Bulkometer, made by Wool Research Organization of New Zealand (WRONZ), was used for measuring the bulk of the wool samples. Bulk of wool samples was measured according to the standard procedure of WRONZ Fibre Bulkometer. A sample of 10g of the scoured wool was weighed and carded for the purpose and was placed into cylinder of the Bulkometer. The sample was then subjected to a maximum pressure and allowed to stand for 30 seconds. The pressure was exerted by the piston and added load, to a maximum of 30cm³/g. The load (i.e. piston and added load) was then removed from the sample, and the later was allowed to recover for 30 seconds. The sample was again subjected to the maximum pressure for 30 seconds, and the height H₃₀ in mm was measured after 30 seconds. The piston and added load was then again removed. After 30 seconds, pressure of piston and added load was again exerted. Unloaded piston was lowered by removing load from the piston and sample was subjected to a pressure of 10cm³/g. Height H₁₀ (mm) was measured and recorded. **The average of H₁₀ (mm)** was the bulk of the wool sample and was calculated as bulk (specific volume) = 0.5 x H₁₀(mm)

STATISTICAL ANALYSIS

The data thus obtained was subjected to analysis using Student Edition of Statistics, version 8.1 (2005), Statistical Software, USA). The data, analyzed has been displayed in the graphical form in the results.

RESULTS

The results obtained from this study presented below:-

Clean wool Yield (%): Average clean wool yield, determined for four breeds of sheep are presented in Table 2. Our findings showed that clean wool yield among four breeds of sheep (Kail, Kali, Pahari and Poonchi) do not differ significantly ($P > 0.05$). The highest value of clean wool yield was obtained for Poonchi sheep breed (91.52 + 6.58%) where as the lowest was recorded for Pahari sheep breed (81.29 + 9.15 %) with intermediate values of 87.31 + 7.74% and 88.30 + 9.42% for sheep breeds of Kail and Kali, respectively as presented in figure 1, showing non difference result among four different breeds of sheep.

Figure 1. Mean values of clean wool yield (%) of different breeds of sheep.

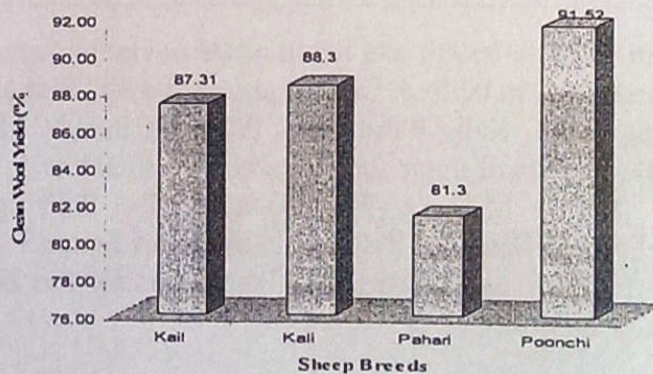


Table 2. Descriptive statistics of clean wool yield (%) of four different sheep breeds.

Breed	Mean	S.D +	Minimum	Maximum
Kail	87.31	7.74	71.88	98.98
Kali	88.30	9.42	55.05	99.72
Pahari	81.29	9.15	47.62	98.16
Poonchi	91.52	6.58	68.90	99.87

Fibre Diameter/Fineness (u): Average fiber diameter, measured for four breeds of sheep are presented in Table 3. Data analyzed showed that fibre diameter differed significantly between Kail, Kali, Pahari and Poonchi breeds of sheep ($P < 0.05$). Average figure diameter among four breeds were as $28.52 + 2.81$ u for Kail, $32.60 + 4.78$ u for Kali, $25.44 + 3.89$ u for Pahari and $26.92 + 2.91$ u for Poonchi showing significant difference (figure 2). The highest value was seen in Kali breed ($32.60 + 4.78$ u) and the lowest fibre diameter was seen in Pahari sheep breed ($25.44 + 3.89$ u).

Figure 2. Mean values of fibre diameter (u) of different breeds of sheep.

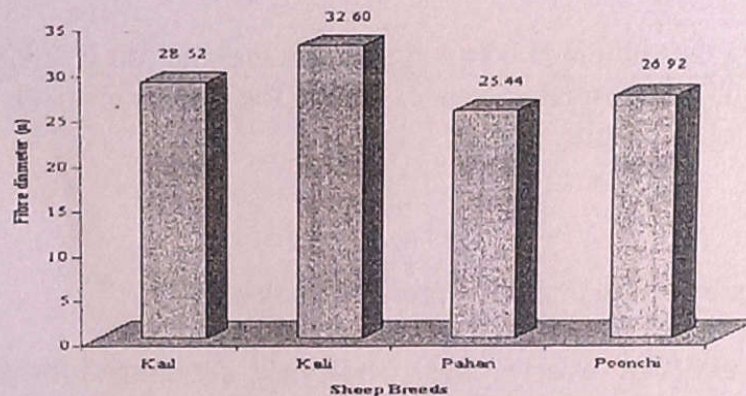


Table 3. Descriptive statistics of fibre diameter (u) of four different sheep breeds.

Breed	Mean	S.D +	Minimum	Maximum
Kail	28.52	2.81	17.308	36.06
Kali	32.60	4.78	17.30	42.60
Pahari	25.44	3.89	19.43	34.43
Poonchi	26.92	2.91	21.44	41.99

Staple Length (cm): Staple length and its standard deviation, measured from experimental sheep breeds are presented in table 4. Data analyzed showed that staple length did not differ significantly among (Kail, Kali, Pahari and Poonchi) breeds of sheep ($P > 0.05$ level of significance). Staple lengths of these four breeds were found as $5.75 + 1.06$ cm (Kail), $6.24 + 1.76$ cm (Kali), $4.13 + 1.65$ cm (Pahari) and $6.15 + 0.88$ cm (Poonchi) respectively showing non significant difference ($P > 0.05$) as shown in figure 3. Higher value was seen in Kali breed ($6.24 + 1.76$ cm) and lower staple length was seen in Pahari sheep breed ($4.13 + 1.65$ cm) as shown in table 4.

Figure 3: Mean values of staple length (cm) of different breeds of sheep.

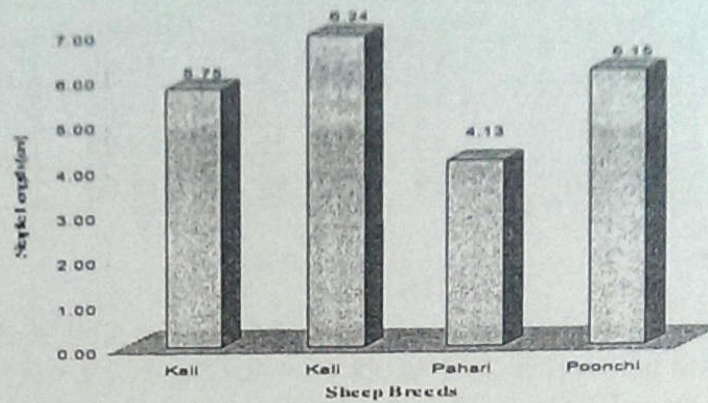


Table 4. Descriptive statistics of staple length (cm) of four different sheep breeds.

Breed	Mean	S.D +	Minimum	Maximum
Kail	5.75	1.06	2.83	9.00
Kali	6.24	1.76	3.38	10.80
Pahari	4.13	1.65	1.67	10.00
Poonchi	6.15	0.88	3.90	8.13

Wool Bulk (cm³/g): Average wool bulk values for wool samples from four breeds of sheep Kail, Kali, Pahari and Poonchi are presented in Table 5. Data analyzed showed that wool bulk differs significantly among all the four breeds of sheep at $P < 0.05$ level. Average wool bulk among three breeds was found to be $21.12 + 2.28$ cm³/g (Kail), $19.34 + 1.71$ cm³/g (Kali), $21.94 + 2.21$ cm³/g (Pahari) and $20.29 + 1.89$ cm³/g (Poonchi) showing significant difference ($P < 0.05$) as shown in figure 4. Highest value was found in Pahari breed ($21.94 + 2.21$ cm³/g) and lowest wool bulk was seen in Kali sheep breed ($19.34 + 1.71$ cm³/g) as shown in Table 5.

Figure 4: Mean values of wool bulk (cm³/g) of different breeds of sheep.

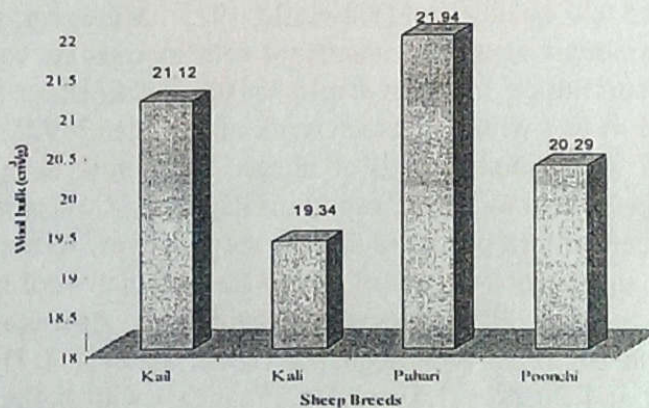


Table 5. Descriptive statistics of wool bulk (cm³/g) of four different sheep breeds.

Breed	Mean	S.D +	Minimum	Maximum
Kail	21.12	2.28	16.00	26.50
Kali	19.34	1.71	16.00	24.50
Pahari	21.94	2.21	18.00	28.50
Poonchi	20.29	1.89	16.00	24.00

DISCUSSION

The average clean wool yield of four breeds of sheep viz. Kail, Kali, Pahari and Poonchi of AJK was found to be 87.31 + 7.74 %, 88.30 + 9.42%, 81.29 + 9.15% and 91.52 + 6.58%, respectively. The results obtained in the current study were non significant ($P > 0.05$). The work done was in line with reports by Isani and Baloch (1996), Khan et al., (1994) and Hasnain (1985), Fibre fineness is one of the most important parameters of the wool as it determines how the wool is to be used. The overall appearance of the product could be affected by the fineness of wool. Average fibre diameter, measured for four breeds of sheep (Kail, Kali, Pahari and Poonchi) differs significantly at $P < 0.05$ level. Average fibre diameter among four breeds was found to be 28.52 + 2.81 u (Kail), 32.60 + 4.78 u (Kali), 25.44 + 3.89u (Pahari) and 26.92 + 2.91 u (Poonchi). Highest value was seen in Kali breed (32.60 + 4.78u) and lowest fibre diameter was seen in Pahari sheep breed (25.44 + 3.89u). Fineness, crimp content and luster of wool of four different breeds of sheep mainly depend upon the topography of the land from which they originate (Mackintosh, 1993). Similarly genetic variation also impacts the significant difference in characteristics of wool fibre (Bawden et al., 2000). Likewise age has significant effect on fibre diameter as younger animals do have the less fibre diameter than the older ones (Taneja et al...1991). Method used to interpret fibre fineness through OFDA show accurate results than the air flow method which was used in previous studies of different breeds of sheep of AJ&K (Khan et al...1994, Qi et al... 1994). Staple length provides good estimate of the fibre length and is easier and time saving to measure. This parameter also influences the performance and the yarn yield. Staple length measured do not differ significantly among four (Kail, Kali, Pahari and Poonchi) different breeds of sheep ($P > 0.05$ level of significance). Staple length among four breeds was found to be 5.75 + 1.06 cm (Kail), 6.24 + 1.76 cm (Kali), 4.13 + 1.65 cm (Pahari) and 6.15 + 0.88 cm (Poonchi) with higher results in Kali breed (6.96 + 5.1 cm) and lower in Pahari sheep breed (4.13 + 1.65 cm). Wool growth rate is not affected by temperature but significantly lower in animals fed low quality diet (Entwistle, 1975). Moreover, the breed characteristics, heredity and environment also play important role in causing variation in staple length. There is negative correlation between staple length and fineness (Muqarrab et al., 2000). The work done was in line with the earlier work of Mahajan (1975) who reported the staple length 3.41 to 6.67 in different breeds of sheep. Wool bulk is of primary interest in the carpet industry. It is defined as "wool's space filling ability". Wools with higher bulk result in bulkier yarn, which in turn produces thicker carpet cover. Average bulk values for wool samples from our experimental breeds of sheep showed that wool bulk differs significantly in these breeds of sheep at $P < 0.05$ level of significance. Average wool bulk among four breeds was found to be 21.25 + 2.28 cm³/g (Kail), 19.34 + 1.71 cm³/g (Kali), 21.94 + 2.21cm³/g (Pahari) and 20.29 + 1.89 cm³/g (Poonchi) with higher value in Pahari breed (21.94 + 2.21 cm³/g and lower in Kali sheep breed (19.34 + 1.71 cm³/g). Different breeds

showed different results and it is in line with the work done by Khan et al., (1994) who reported that wool bulk differed in different sheep breeds. These results are completely in opposition as reported by Khan et al., 1994 who also showed wool bulk range of 18.2 to 27.5.

CONCLUSIONS

- Wool characteristics which were studied in this research work provide the basic information about the semi fine wool, mostly produced from the sheep breeds of AJ&K.
- This study provides the suitability of AJ&K sheep breeds (Kail, Kali, Pahari and Poonchi) wool for commercial purpose.
- The wool characteristics of sheep breeds like average clean wool yield, fibre diameter, staple length and wool bulk are documented, which would provide basic information for the local cottage industry.
- The percentage of clean wool yield estimation is important for commercial reasons as this measure is used in determining the price of wool.
- The measurement of fibre diameter / fineness was done through Optical Fibre Diameter Analyzer (OFDA); the latest and most accurate method which has been used during this study. This parameter alongwith the staple length has special significance for the wool spinning performance and yarn yield.
- Wool price increases with decrease in fibre diameter. The finer wool, like AJ&K sheep breeds wool, is used to produce worsted yarns which in turn are used for valuable apparel. The visual appearance of finished product or the fabric is also influenced by the degree of fineness of wool.
- The measurement of wool bulk of sheep breeds in AJ&K is first time documented in this study. Wool bulk is of primary interest in the carpet industry. Wool, with higher bulk result in bulkier yarn, which in turn produce thick carpet cover.
- This research work provided the guidelines for sheep wool growers and wool processors for establishing wool marketing and wool processing channels in AJ&K.

RECOMMENDATIONS

On the basis of this research work; the types of Wool produced (Kail, Kali, Pahari and Poonchi) are more suitable for the local cottage industry for the manufacture of hand knotted carpets, yarn, rugs, lohi, pattu, patti, coats, jackets, caps and Namdas, for export as well as local use.

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ATTITUDE OF YOUTH (UNIVERSITY UNDER GRADUATES) TOWARDS
BLOOD DONATION OF UARAWALPINDI – PAKISTAN

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ABSTRACT

A study was conducted to investigate the attitude of youth towards blood donation through questionnaire comprising twelve (12) questions, of 220 undergraduate student youth of 20-25 years, in May-2010, at PMAS University of Arid-Agriculture Rawalpindi. The data was subjected to proper statistical analysis. Majority of the respondents had positive attitude towards Blood donation 80-100%, 85(40%) strongly agreed to donate blood and 164(70%) showed family members as preferences. A vast majority of 198 (90%) opined to donate blood for saving life. A good majority of 110 (50%) knew the major source of awareness of Blood donation through TV, followed by family members (30%) and 10% through friends. Majority of respondents (90%) knew that proper test be done before making a donation. In response to another question 55(25%) showed fear from AIDS, followed by 45(20%) as fearful from Hepatitis while 75(35%) were fearful from anemia. While 45(20%) feared from other viral diseases. Literature reviewed from a dozen workers, is also included. The study ends with conclusions and recommendation of blood donation to needy persons, in emergencies and in other accidents, to save human life.

Key words: Blood Donation, Attitude of Youth, University under graduates, UAAR Rawalpindi, Pakistan.

INTRODUCTION

Blood has always held mysterious fascinations for all and is considered to be the living force of our body. It is an immunological tonic for the treatment of various disorders. Today, the use of whole blood is a well-accepted and a commonly employed measure, without which many modern surgical procedures can not be carried out.

Blood is an essential element of human life and there are no substitutes as it is a critical component in improving health and in preventing the spread of infectious diseases, globally. Millions of lives are saved each year through blood transfusions, yet the quality and safety of blood transfused is still a concern, particularly in the developing countries. About 05 of new HIV infections, worldwide, are transmitted through unsafe blood transfusions. The reason for this includes blood collection from unsafe donors, poor laboratory procedures and inadequate testing. Blood will be safe if there is a nationally coordinated blood transfusion service against, collection of blood only from voluntary non-remunerated donors, testing of blood for transfusion free from transmissible infections and by transfusion of the right blood to the right patient through the appropriate blood group.

There should be enough blood units in a blood banks available for emergency requirement. The hospitals rely on the relatives of a patient to donate necessary blood, as there are not enough voluntary blood donations to help the needy patients. The need for blood is growing day by day as a result of advancement in the clinical medicine. In terms of the

need for blood transfusion, it is noted that in the country, the death toll for road accidents has increased due to non-availability of blood transfusion services near the accident site(s).

REVIEW OF LITERATURE

The work done by researchers from different countries in connection with awareness of blood donation has been briefly presented below:-

Fernandez Montoya *et al* (1996) in their study in Saragossa reported that there were 197 donors and 303 were non donors out of 400 people surveyed. There was a big difference between donors and non-donors just because of their beliefs and attitude towards blood donation. They concluded that the donors mean age was 37.8 years and were 58.4% in females while 41.6% males with average number of 6.02 donations. The non-donor mean ages was 39.8 years and were 53.8% females and 46.2% males. Regarding motivation of donors, higher proportion was related with sense of solidarity of duty (26.4%) followed by issues of pressure or information (23.4%) and possible personal or family benefits that donation might bring (21.8%). The initial maturation of most donors (75.9%) had not varied with passage of time. Most non-donors denied any worries about blood donation (70.9%) and did not agree that those who needed blood should be those who pay for it (92.8%). For non-donors lack of information (43.6%) different fears (32.3%) was the principal factor discouraging blood donate.

Olaiya *et al* (2004) in Lagos city of Nigeria found that 92.2% people donated blood hospital benefits so stating that a large number of people who wanted to donate blood but a less member of people who did not want to donate. Summary interviewed with questionnaires on their knowledge, attitudes, beliefs and motivations about blood donations. It was found that a large number of them (92.9%) donated because of the benefits they will obtain from the hospital. Such benefits include antenatal registration (67.1%) and saving the lives of relations (25.8%). Even though many of the donors are educated (98.9%), majority of whom have university degrees (36.1%) and have heard about blood donation before, 52.4% of them believe they can contract Human Immunodeficiency Virus (HIV) and/or hepatitis infection from blood donation. A good number (47.0%) are afraid of what they regard as side effects, such as weight loss (23.8%), sexual failure (5.9%), high blood pressure (5.2%), sudden death (3.3%), and convulsion (1.47%). About 41.0% prefers certificates as an incentive for donation, whereas 13.6% prefers money; less than 3% will like their names announced or published on the media and 2.58% will donate for nothing. It is recommended that an intensive blood donation campaign should be maintained. This will allow people to be well informed, turning the positive attitude of saving life through blood donation to a regular practice.

Fernandez Montoya *et al* (1998), in vox sanguinis found, out of a survey of 126 people that with the passage of time donor's attitude were changing in a positive side. Thelma Gonzalez *et al* (2008), in Sao Paulo, Brazil found out of a survey of 1600 people. Mostly feared by the varus of HIV because of little knowledge and the attitude were going negative towards donation. Maqbool Alam *et al* (2006) in Pakistan found that the attitude of army people towards blood donation was positive 20.5%. They found as donors and 79.5% non donors. They are totally misconcepted about blood donation and going through

many superstition one regarding blood donation, out of survey conducted at a remote place.

Buciuniene *et al* (2006) in Lithuania found that a large number of people of Soviet Union 83% were paid donors actively doing the donation and getting/earning money from this and majority wanted to donate in case of emergency. Allej *et al* (1993) found that many people were fearful about blood donation process. Their conclusion was if the knowledge was increased, there could be less fear of people for blood donation. Sojaka *et al* (2008), in Suedin, they found that people wanted to be active donors they wanted to donate to friends, family/relatives were influenced from media for donation.

Malhe Cho (2008) compared data of Blood Donation trends in Haiti for he years 2004 through 2008. He concluded that Blood donation trends were increasing based on total blood collectives over five years collected from 9513, 10823, 13622, 17096 and 19696 donors for the years 2004, 2005, 2006, 2007 & 2008 respectively. The voluntary blood donors for these years were 05%, 15%, 27%, 52% and 66% respectively. The trends of family donors for these years recorded were 95%, 85%, 73%, 48% and 34% respectively. He also recorded that the awareness amongst donors was 95% through Radio, 80.8% from T.V and upto 5-20% from news papers.

Every blood transfusion carries with it some calculated risks. It is not now and probably never will be completely safe. Truly speaking voluntary blood donors are the bricks of the human survival called blood transfusion. The presence of professional blood sellers, however, cannot be ruled out among the replacement donor in the garb of relatives or friends. This study was carried out with the following two of its objectives:

- i. To know the behavior of our youth towards blood donation and
- ii. To find out the fears of a person during their transfusion of blood for saving precious lives.

MATERIAL AND METHODS

Period of the study May-2010 and the area of the study selected for the research was the University of Arid Agriculture Shamsabad, Murree Road Rawalpindi. It is one of the best universities of the country. Sample of only 220 students from various departments, including Sociology. Their age were 22 to 25 years, The Quantum of Samples as 220. The data collection tool was the questionnaire method. All of the students filled in the questionnaire.

The data thus collected was subjected to proper statistical analysis. The analyzed data has been presented in the tabulated forms in the results.

RESULTS & DISCUSSION

The total 220 samples taken (from the students of Arid Agriculture University) .Showed the sex ratio, of the respondents as 45% males while females were 55% .The marital status of all respondents was single. The education of all respondents was under Masters degree. Respondents knowing their blood group were 65% while those not knowing their blood group were 35%.

Table-1 Showing the response and age of the respondents

Respondents	Frequency	Percent
20-22	170	85%
23-25	030	15%
Yes	3	15%
No	17	85%

Result-1

The age of the large majority (85%) were between 20 to 22 years & 15% respondents were of 23 to 25 years. Majority of the respondents (85%) had not donated blood while a small number of respondents (15%) were the donors of blood (5%) had donated blood many times while 10% had donated blood only, once, as appears in table-1.

Table-2 Showing the favour and preference of Blood donation

Respondents	Frequency	Percent
Strongly agree	85	40%
Agree	92	45%
No opinion	11	05%
disagree	04	10%
Family	164	70%
Every one	011	5%
Friends	011	5%
A needy patient	034	15%

Result-2

Most of the respondents (45%) agreed similar number (40%) strongly favoured blood donation but eleven (11%) had no opinion about it. Two percent did not favor blood transfusion, as appears in Table No.2.

Result-3

A Larger majority of respondent's (70%) gave preference to their family regarding blood donation while 15% revealed to donate to needy patients: Equal Respondents (five percent) preferred to donate blood to friends and every one as appears in Table No.2.

Table-3 Showing the reason and idea of respondents positively

Respondents	Frequency	Percent
For good health	022	10%
To save life	198	90%
To earn money	0	0%
Yes	20	100
no	0	0

Result-4

A larger majority of 90% respondents wanted to donate blood for saving lives while a smaller number of respondents (10%) wanted to donate blood for good health. No one wanted to give blood to earn money, as detailed in Table-3.

Result-5

100% of the respondents believed that they can save any human life by their precious donation(s).

Table-4 Showing the respondents source of knowledge for blood donation

Respondents	Frequency	Percent
T.v	110	50%
Family	66	30%
Friendly	022	10%
Radio	011	05%
newspaper	011	05%
Yes	198	90%
No	022	10%

Result-6

Large majority of 50 % knew about blood donation from TV while only 10% knew from family. Less number of respondents (5%) knew from radio and newspapers, as presented in table-4.

Result-7

Larger majority of 90% knew proper blood test before donation while least number of respondents (10%) did not know about tests, as tabulated in Table-4.

Table-5 Showing respondents showing fear of some disease due to blood

Respondents	Frequency	Percent
Aids	55	25%
Hepatitis	45	20%
Anemia	75	35%
Other viral disease	45	20%
none	0	0%
Bad health	05	25%
Belly goes fat	01	5%
Feel uncomfotable	07	35%
Obesity	05	25%
none	02	10%

"A" BLOOD GROUP	011	5%
"B" BLOOD GROUP	054	25%
"O" BLOOD GROUP	045	20%
"AB" BLOOD GROUP	077	35%
DON'T KNOW	032	15%

Result-8

35% respondents were fearful of anemia and 5% of aids, twenty percent of respondent each fearful of hepatitis and other viral diseases, as shown in Table-5.

Result-10

Absolute majority of 100% were willing to go for blood donation, in current situation of terrorism & suicide attacks, to save human lives.

Result-11

A Larger number of 35% felt in-comfortable about blood donation while 25% had the idea of obesity with blood donation yet another. Five percent shows belly will be gone fat while 25% had the idea of bad health only. Ten percent (10%) had no misconception regarding blood donation as shown in the Table-5.

Result-12

A large number of 35% said that blood group AB are universal blood groups while 25% responded that B is the universal. Twenty percent (20%) said that "O" is universal while only 15% told that they don't know. A least number of 15% said "A" group is universal as shown in Table-5. Actually "O" is a universal group but least respondents had information of it.

CONCLUSIONS

Through this research work on the attitude of youth towards blood donation it was assessed that the youth is strongly in favor of blood donation. Their attitude is almost positive and they wanted to donate blood but they had not got any chance to donate blood. Only 15% of the youth got the chance to donate blood and rest of them never donated they however wanted to do it strongly. The general majority was aware of blood donation, out of the number of 220 respondents. On a large scale the utmost priority of the youth was to donate their blood to their family members. Family is the first priority of the majority of the youth and after that they fave priority to their friends, then to needy patients and last priority was to donate their blood to everyone. The majority wanted to save human life by their donation. In the current situation of Pakistan they wanted to give their donations to save

human lives of victims of suicide attacks. Most of our findings are in agreement with the work presented in the review.

Most of the youth is aware of blood donation just because of the media. Media is playing the key role in these types of awareness specially the television and radio is most important. Most of the youth consider newspapers as fourth source of awareness because they don't read it regularly.

This research shows that majority of respondents were fearful of some infectious diseases after donating blood, due to unhygienic conditions in the hospitals i.e. AIDS, Hepatitis and some other viral diseases. Most of them also had misconception that they will have bad health or the obesity or have big belly, afterwards. Youth had little awareness of the universal blood group which is actually "O".

RECOMENDATIONS

There should be clean and clear atmosphere of the hospitals or the process of blood donation, should be according to the rules of the cleanliness so that the fear of the infectious diseases like hepatitis or the other diseases could be rooted out. People could donate blood without any fear. Education plays an important role in making them positive towards transfusion.

Blood is a living matter which can be transfused to save lives. Serious loss of blood due to an accident or disease can cause shock or even death (WHO, 2000). An increased awareness among the public that blood donation is a safe process and also about the need for blood donation will increase the regular voluntary blood donations in the country.

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(ANNEXURE)

QUESTIONNAIRE

ATTITUDE OF YOUTH TOWARDS BLOOD DONATION

1. Name _____.
2. Age _____.
3. Sex a. Male b. Female
4. Education _____.
5. Blood group _____.
6. Did you ever donate blood?
a. Yes b. No
7. If yes than how often you donate.
a. Many times.
b. Once.
c. Rare.
d. A regular donor.
8. Why you don't want to donate blood.
a. Are you diseased person.
b. Having no information about it.
c. Fearful of any disease after donating.
d. Are you a drug addict.
9. Are you in favor of blood donation.
a. Strongly agree
b. Agree
c. Don't know
d. Disagree
10. To whom would you prefer to donate (rank them as 1, 2, 3, 4)
a. Family _____
b. Everyone _____
c. Friends _____
d. A needy Patient _____
11. For what purpose you would donate blood to
a. Good physical health
b. To save life
c. To earn money

12. Do you think you can save life by you precious donation:
a. Yes b. No
13. From which source you get information about blood donation:
a. TV b. Radio c. friend's d. Newspaper e. family
14. Do you know you know that you should have a proper blood test before donation:
a. YES b. NO
14. Are you fearful of some disease after donation like :
a. AIDS b. Hepatitis c. Anemia d. other viral disease e. none
15. In current situation in Pakistan would you like to donate blood:
a. Yes b. No
16. Any misconception about blood donation:
a. bad health
b. belly goes fat
c. feel un comfortable
d. obesity
e. none
17. You know that which blood group is called universal group
a. (i) b. (ii) c. (iii) d. (iv)

PROXIMATE ANALYSIS OF FODDER TREE LEAVES OF DISTRICT RAWALPINDI, PAKISTAN

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ABSTRACT

Seven important fodder tree leaves from district Rawalpindi, Pakistan were studied for proximate components. *Acacia nilotica*, *Acacia modesta wall.*, *Albizia lebbek (L) Benth.*, *Morus alba (L.)*, *Prosopis cineraria (L.) Dice* and *Zizyphus nummularia* were identified and analyzed for DM (Dry Matter), CP (Crude Protein), CF (Crude Fiber), Ash, EE (Ether Extract). The DM, CP, CF, ash EE contents of the leaves varied from 39 to 50, 11 to 20, 13 to 27, 5 to 13, 1 to 7, of% of DM, respectively.

Key words: Proximate Components, Fodder Tree Leaves - Rawalpindi - Pakistan.

INTRODUCTION

Livestock is regarded as most vital part of the national economy since the emergence of Pakistan and it has contributed approximately 53.2 percent of the agriculture value added and 11.4 percent to national GDP of country. Livestock farming is vital for the supply of meat and milk and also a source of our additional income for small farmers and livestock owners. The population growth, increase in per capita income and export revenue is fueling the demand of livestock and livestock products. The shortage of fodder during winter is one of the major limiting factors for livestock production in the developing countries. It is well known that deficient nutrition due to scarcity of feeds is one of the major constraints in ruminants' productivity. That deficiency leads to under nourishment, low productivity and breeding problems to livestock (Humphreys, 1984). Fodder tree and shrub species are mostly required as supplement to low quality feeds. Leaves of the different species of trees could provide nutritious fodder during scarcity periods (Reddy, 2006) and these are almost as nutritious as that of the leguminous fodder crops (Reddy and Elanchezhian, 2008). Fodder tree and shrub leaves make an important component of ruminant rations. Tree fodders contain high levels of crude protein and minerals and many show high levels of digestibility (Zafar *et al.*, 2009; Khanum *et al.*, 2007). The present investigation was undertaken to determine the nutritional quality of some leaves of trees grown in Rawalpindi district.

MATERIAL AND METHODS

Identification of fodder tree species: Local farmers were asked about the names of trees in local language (Pothohar), species of animal fed and trends in their frequency. After that the samples of different fodder tree species were collected and their specimens were sent to Weed Management Program (WMP), National Agricultural Research Centre, Islamabad, for botanical identification.

Collection and preparation of samples: Most dominant fodder tree leaves in the region, which are being used for feeding ruminants locally, were *Acacia nilotica*, *Acacia modesta*, *Albizzia lebbeck*, *Morus alba*, *Prosopis cineraria* and *Zizyphus mummularia*. All the tree leaves were cut into small pieces so as to facilitate easy handling and uniform sampling for analysis. Samples were dried in the hot air oven at 65°C for 24 hours and ground to pass through 1-mm sieve, grinded, and stored in polythene bags, at room temperature.

Chemical Analysis: Dry Matter (DM), Crude Protein (CP), Crude Fiber (CF), Ether Extract (EE), ash and Nitrogen Free Extract (NFE) of the samples were determined according to AOAC (1994). Crude protein was estimated by micro kjeldhal method. Oven dried sample was digested with H₂SO₄ in the presence of catalyst mixture containing H₂SO₄ and CuSO₄. A known aliquot of the diluted sample was distilled in the presence of 10 ml of 2% boric acid solution and titrated against standard 0.1 N H₂SO₄. The percent of nitrogen was calculated for the estimation of CP. The ether extract in a sample was determined by extracting with diethyl ether at 60°C in Soxhiet's apparatus. For crude fiber, sample was reflexed first with 1.25% H₂SO₄ and subsequently with 1.25% NaOH for 30 minutes each to dissolve acid and alkali soluble component present in it. The residue containing CF was dried to a constant weight and the dried residue was ignited in muffle furnace, loss of weight on ignition was calculated to express it as CF, for ash, sample was ignited in muffle furnace at 550°C to burn all the organic matter and leftover was weighed as ash. Nitrogen-free extract was calculated on dry matter basis as; % NFE = 100 - (% CP + % CF + % EE + % ash)

STATISTICAL ANALYSIS:

The average figure with their standard derivation has been given with the help of Minitab version 15.1, in the results, in the tabulated forms.

RESULT AND DISCUSSION:

The proximate composition of fodder tree leaves is given in table 1. The dry matter (DM) contents of various fodder tree leaves used for feeding livestock in the study area varied from 39.24% to 52.43 with mean value as 49.05 ± 5.97 %. Most of the samples contained DM more than 45 %, while only few of them contained less than 30 % DM (Table 1). Higher DM contents could be due to the time of sampling between November and January, after 6 months of little new growth. Moreover farmers start harvesting of the fodder tree leaves somewhere in October when other sources of green forage are declining and it continues till the end of March /April. Actual harvesting time and its duration, however, depends on the availability of fodder and numbers of ruminants a farmer owns. Nevertheless, it indicated that these constitute an important, reasonable and reliable source of DM, beside other nutrients, for feeding ruminants in Rawalpindi. The CP contents of fodder herbs varied from 11.48 to 19.43 % with mean value as 16.11 ± 2.78%. Such result have been demonstrated in other tree legume browse, in various studies (Ebong, 1995; Abduirazak *et al.*, 1997). The findings of this study were in line with those of Bakshi and Wadhwa (2007) who also reported a high CP in the *M azedarach* and *M alba*. Srivastava *et al.*, (2006) reported high CP contents of *M alba*, i.e. 15.31-30.91% on DM basis. These

variations could be a result of agronomic factors such as application of various levels of nitrogen fertilizers, time of harvest, ensiling, field drying and storage. Similar findings have been reported in Italian rye grass for its dry matter yield, which varied from 18.8 to 75.5% mainly due to different harvesting time (Bittante & Andrightto, 1982). Like DM and CP, other nutrients could also vary in different feeds due to agroclimatic conditions, cultural practices and post-harvest processing and storage conditions. The crude fibre contents varied from 13.91 to 26.45% with mean value as $19.86 \pm 3.94\%$. Kandyliis, *et al* (2009) reported the low value of the CF in *Morus alba*. The ash contents varied from 5.30 % to 12.17 with mean value as $8.55 \pm 2.17\%$. Overall chemical composition of the leaves varies according to variety, degree of maturity, leaf position within the branch and fertilization level as detailed by Shayo 1997 by Singh and Makkar 2002.

Table 1. Proximate composition (% DM) of fodder tree leaves of District Rawalpindi-Pakistan

Fodder Tree leave	DM	CP	CF	Ash	EE	NFE
<i>Acacia modesta</i>	52.43	17.26	22.80	8.08	2.13	50.73
<i>Acacia nilotica</i>	45.78	13.81	13.91	7.86	2.73	63.69
<i>Albizzia lebbeck</i>	39.24	18.50	26.45	10.41	5.04	38.60
<i>Melia azedarach</i>	48.79	17.09	18.96	5.30	4.04	54.61
<i>Morus alba</i>	58.69	19.43	14.49	12.17	6.45	47.46
<i>Prosopis cineraria</i>	48.15	15.23	18.19	8.16	1.85	56.57
<i>Zizyphus nummularia</i>	50.28	11.48	20.21	7.93	1.44	58.94
Mean	49.05	16.11	19.86	8.55	3.38	52.94
SD	5.97	2.78	3.94	2.174	1.858	8.25

DM = Dry matter, CP= Crude protein, CF=Crude fiber, NFE=Nitrogen Free Extract, SD = standard deviation

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EFFECT OF SALT STRESS ON THE GROWTH AND YIELD OF DIGITARIA GRASS (*Digitaria decumbens*) IN-VITRO

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ABSTRACT

In-vitro experiment was carried out in plastic buckets containing acid washed and autoclaved Silica sand. Ten uniform plants of *Digitaria decumbens* (Finger grass) were treated with half strength of Hoagland solution alongwith sodium chloride in 1:1 ratio to maintain their respective salinity levels i.e. 1.0 (control) 2.0, 4.0 6.0 and 8.0 dSm⁻¹ with three replications in Randomized Complete Block Design (RCBD). Solutions were changed on alternate days and thinning was done after two weeks. Five plants per pot were maintained for final observations. The crop was harvested after eight weeks of planting to evaluate the effect of salinity levels on the survival, plant growth and uptake of ions by *Digitaria decumbens*. The results indicated that survival of plant was significantly affected by increasing level of salinity. Plant height, number of tillers per plant, leaf length decreased with increased salinity levels. Dry weight of tillers and roots also decreased with the increase of salinity. Uptake of Na and K by root increased at higher salinity level. Uptake of Mn increased while Fe decreased with every increasing salinity level in root. However, the *Digitaria decumbens* could be established as a forage crop in moderately saline rangelands.

Key words: *Digitaria decumbens*, Salt tolerance, Ionic concentration, NARC-Islamabad-Pakistan.

INTRODUCTION

Food, fodder and fuel are the requisites for the growth of a country. Salinity is a serious problem and it is a great threat to agricultural production in Pakistan. It has been estimated that approximately one lac acres of good soils in Pakistan are deteriorated each year. According to an estimate, 37.4 million acres of irrigated land and about 10.1 million acres of rangelands of Pakistan are affected by salinity, mostly caused by chloride, sulphate and carbonate of sodium. Soil salinity is serious problem in many regions of the world as well as in Pakistan and posing major threat as the sustainable production of agriculture sector. It is estimated that 6.62 m ha is salt affected (Anonymous 2007). The regulation of Na uptake by cells and long distance Na transport is considered to be a critical adaptation of plants to salt stress (Munns *et al.*; 2006). Soil salinity is a burning problem in the South East Asia affecting the vast areas of Indian sub-continent including India, Pakistan and Bangladesh. Salinity is the major threat posed to the performance of irrigated agriculture in arid and semi-arid regions of the world. In Pakistan out of 14.5 m. ha of canal irrigated land, 5.7 m. ha are reported to be salt-affected (Chaudhry *et al.*, 1978). Abiotic stresses such as salinity, water logging and temperature etc; drastically affect crop productivity worldwide (Taiz and Zeiger, 2006). It is very clear that major parts of normal lands under cultivation are already being used to grow food for the ever increasing population of the country. Another bigger share goes under fodder crops to feed the livestock are again as ultimate food for the people. However, about 6.5m. ha of land are salt affected out of which approximately 2m. ha are slight to moderately affected (Ullah and Hussain, 2007). Salinity and aridity pose one of the greatest threats to agriculture. It may be considered as the cancer of soil. It is estimated that about one third of irrigated land (about 76 m. ha) is

affected by salts, in the world (Epstein, 1980). Salinity affects many aspects of metabolism of plants and change their anatomy and morphology. Salt affected plants usually show stunted growth and have dark green leaves which in some cases are thicker and more succulent. Specific loss affects plant growth through nutrient imbalance of direct sodicity. Sodium is reported to become deleterious to plant growth than Calcium. Toxic effects of one ion can be reserved by the presence of its antagonistic ion. Thus in sodic soils toxic and harmful effects of Sodium can be minimized by using Calcium.

It is now well established that differences in salt tolerance exist not only among different species, but also within certain species (Munns *et al*; 2006). However plants grown on saline environments have developed adaptations to salt stress by different mechanisms, including non-physiological and biochemical adaptation (during the evolutionary history of adaptation) in such habitats (Ashraf; 2006).

Heavy population presence demands effective utilization of saline soils either by reclamation or by growing some salt tolerant plants. Different genera, species and even different varieties of a species respond differently to the same type of salinity under similar environmental conditions. Even a given variety is affected differently at different stages of development e.g., germination and growth. Halophytes are distributed in coastal and inland saline habitats and face direct and secondary effects of salinity stress at every stage of their life cycle (Khan and Qaiser; 2006). Germination is reported to be more vulnerable stage to salinity than others (Khan and Gul; 2006). Finger grass (*Digitaria decumbens*) is a native species of South and East Africa. It is a palatable pasture grass and withstands livestock grazing and trampling well. It forms good soil cover and may be used for the control of soil erosion. Work described here deals with the salt tolerance in terms of plant growth and uptake of ions, in finger grass, to evaluate its fitness for saline rangelands in Pakistan. Finger grass has produced significantly greater total forage yield, than other grasses, in salt affected soils. (Siegfried, 1990).

MATERIAL AND METHODS

This study was carried out in plastic buckets containing acid washed and autoclaved Silica sand (at 15 lb/ sq. in, at 121 °C for 15 minutes). Ten plants of *Digitaria decumbens* having uniform size and age were planted in these buckets using the method of modified bottle jar assemblies described by Yoshida *et al*, 1972. The plants were applied half strength Hoagland solution alongwith sodium chloride and calcium chloride in 1:1 ratio to maintain their respective salinity levels i.e., 1.0 (control), 2.0, 4.0, 6.0 and 8.0 dSm⁻¹ with three replications, in a Randomized Complete Block Design (RCBD). Solutions were changed on alternate days and thinning of the plants was done after two weeks. Five plants per pot were maintained for final observation. The crop was harvested after ten weeks of planting.

Observation on plant survival, plant height, number of leaves, leaf length, leaf area, and dry weight of tillers and roots recorded at time of harvesting. The plant material was oven dried, digested and analyzed according to the procedures. The data were subjected to statistical analysis methodology narrated by using Steel *et al*; 1997.

RESULTS AND DISCUSSIONS

Survival of plants was significantly affected by increasing level of salinity. Plant survival was not influenced by salinity up to 2.0 dSm⁻¹. On the other hand, plant survival was only

26.7% at 8.0 dSm⁻¹. The plants at this level failed to grow and died back after one week. It may be due to the failure of plants to absorb water at higher osmotic pressure (Table - 1).

Height of plants was significantly affected by salinity. However, the effect was non-significant up to 2.0 dSm⁻¹. Same was the case with number of tillers per plant. Number of leaves per plant did not respond to different salinity levels. Leaf length, however, decreased significantly, due to the presence of salts. Dry weight of tillers and roots also decreased with the increase in the levels of salinity as detailed in table 1.

High salt concentration related the root and shoot growth of finger grass. Suppression in root growth may be due to accumulation of sodium and chloride ions. Inhibition of growth by NaCl suggests that salt toxicity due to higher NaCl concentration might have influenced the metabolic processes such as synthesis of nucleic acids and proteins. Salt may affect synthesis of nucleic acids, proteins and certain enzymes which regulate the process of growth. Growth suppression at higher salinity levels is also attributable to the osmotic pressure. Plants grown under saline conditions have the ability to adjust their osmotic pressure so as to neutralize external pressure, however, this growth stage remains suppressed due to accumulation of salts in the cell sap. Plant growth could also be suppressed due to inability of certain sub cellular organelle to adjust themselves to high osmotic pressure prevailing in the cell sap. Using the criteria of 50% reduction in dry weight at a certain salt level as a basis for salt tolerance, finger grass showed tolerance against salt stress up to 4.0 d Sm⁻¹ as presented in table-1.

Uptake of Na and K by the root increased at higher salinity level. However, the antagonistic effect of Na and K was noticed in shoots only. Antagonistic effect of Na on K has also been observed in a number of plants. Uptake of Zn was non-significantly affected 2.0 and 4.0 dSm⁻¹ but in it increased significantly at 6.0 d Sm⁻¹ in root and shoot. In finger grass the interaction was observed in root while it was absent in shoot. Uptake of Mn increased and that of Fe decreased with every increasing salinity level in root and hence the antagonistic effect of Mn and Fe was clearly observed. However, in case of tillers maximum uptake of Fe was observed at 2.0 dSm⁻¹ only as in evident from table-2.

The work done here can serve as a basis for further studies on physiological aspect of salt tolerance in Fingers grass. The grass could be establishment as a forage crop in moderately saline in rangelands.

Table 1. Survival percentage and growth of *Digitaria decumbens* at different salinity levels.

Parameters	1.0 (control)	2.0	EC(dSm ⁻¹) 4.0	6.0	8.0	CD ₁	CD ₂
Survival percentage	83.2	86.7	66.7	40.0	26.7	14.17	20.62
Plant height (cm)	107.03	98.22	20.83	13.87	-	16.15	24.66
No. of tillers/plant	4.08	3.64	182	1.51	-	0.44	0.67
No. of leaves	7.08	7.61	6.17	5.92	-	1.35	2.04
Leaf length (cm)	50.88	42.07	46.73	37.45	-	10.99	16.65
Leaf area (cm ²)	45.89	26.92	20.13	14.65	-	7.42	11.24
Dry wt. of tiller (gm)	4.52	3.58	1.68	0.62	-	0.66	1.00
Dry wt. of root (gm)	122	1.03	0.67	0.20	-	0.37	0.56

CD₁ = critical different at P<0.05 and CD₂ = critical difference at P<0.01

Table-2: Showing Uptake of ions by *Digitaria decumbens* at Different salinity levels.

Uptake of ions by roots (ppm)							
EC dSm ⁻¹	Na	K	Zn	Cu	Mn	Fe	P
10	3622	6376	61.0	22.0	260	525	1092
2.0	5879	6632	60.0	25.7	345	76	1211
4.0	16226	11220	63.0	18.7	411	51	1366
6.0	27679	13446	99.7	16.7	805	49	1344
CD ₁	2891	1440	6.0	4.3	42.8	15.9	125
CD ₂	4517	1282	9.4	6.5	64.9	24.0	190

CD₁ = critical difference at P<0.05 and CD₂ = critical difference at P<0.01

Table-2:

Uptake of ions by shoots (ppm)						
Na	K	Zn	Cu	Mn	Fe	P
11190	40791	36.0	6.33	18.3	250	1278
17800	26730	370	8.00	25.0	460	1250
22337	16580	37.0	7.67	39.0	283	1420
30464	11900	42.3	7.00	79.0	347	1270
2736	6670	5.9	1.37	4.7	7.5	185
4144	10104	8.9	2.1	7.0	11.3	178

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REVIEW OF ECONOMIC LOSSES DUE TO ENDEMIC LIVESTOCK DISEASES IN PAKISTAN

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ABSTRACT

Economic losses due to livestock Diseases, being a vast subject spread over viral, Bacterial, Parasitic, fungal and clinical syndromes of large & small ruminant while only bacterial and parasitic diseases in poultry have been attempted in a summarized manner. Scattered information from various Reports, Journals, Proceedings of various symposia, seminar and / or conferences at home & abroad have been gathered and losses, in rupee terms and, at some places in Dollars, have been calculated, keeping in mind the prevailing market rates of particular area and time. Efforts were made to concentrate on the Endemic diseases of the country & some information from other countries. Losses of 3508 millions liters of milk per year were reported in India during 1990 (Sexena *et al*, 1994), and losses in milk in Turkey were estimated to be 141 million liters due to FMD, while analyzing the data of FMD out break, in Sahiwal cattle, it has been reported that 70% of the herd was affected, (even though it had been vaccinated previously) and there was a loss of 69% milk yield and 74% loss of body weight. The economical losses estimated through GTZ were Rs.10.82 billion in Punjab. The economic losses due to FMD. The incidence in that report ranged 1.1 and 5.5%. Recently in 2007 FAO assisted TAD Surveillance and epidemiological survey indicated 5.3% to 16% and 0.2% to 3.3% in buffaloes and cattle respectively. This incidence was reported as 7.7% in a population of 112810 buffaloes and cows in six selected Districts namely Faisalabad, Khanewal, Multan, Okara, Pakpattan and Sahiwal out of Fifteen (15) villages selected from each District. Economic losses include upto 1/10th of total production of milk on first day while it may double the second day, and if no treatment is started the milk production may reduce to 50% although feed in take may continue. In the year 2007 the retail of milk being Rs.30/- per liter and in the year 2008 Rs.40/- per liter. In the year 2009 the retail was Rs.54-55/- per liter, while in 2010-2011 this rate was Rs.65/- to 70/-. The reader(s) can easily work out the total loss in rupees. It has also been observed that in such symptoms the farmers rush for treatment, otherwise the infection spreads like an endemic within the herd/flock and the loss goes doubling and tripling. Work done and documented of such losses, for the last 10 years have selectedly been included in this paper.

Key Words: Economic losses, viral diseases, bacterial diseases, parasitic diseases, endemic diseases Pakistan.

INTRODUCTION.

The subject matter has been discussed at various forums, symposia, seminars and conferences but actual losses in terms of rupee content or US Dollar content are rare. Various reports of VRIs journals from home & abroad, including the joint FAO/WHO/OIE Annual reports for the last three years Viz:2007-08, 2008-09 and 2009-10 were extensively consulted. The data and the information, thus collected has been presented in this review article. Care has been taken to include cost of live animals, milk & meat produced, cost of feed & fodder and the time the information was collected. Example:- The market rate of a milch buffalo in 2003-04 was Rs.26,000/- to Rs.28,000/- and the milk rate per liter was Rs.20/-, which rose to Rs.45000/- to Rs.48000/- in the year 2007-08 like wise the milk rate per liter was Rs.30-32/-. Simultaneously the rate of meat, specially beef was Rs.170/- kg in

Rawalpindi-Islamabad twin cities in the period 2003-04 which shot up to Rs.250/- in the year 2007-08 as reported in the News Papers & Electronic Media as well as documented by the Author in the Text Book, "Livestock Industry" code, 782, AIOU Book series, and in the Second authentic informative book, "Economic losses due to livestock diseases", 2010 by the author. Hence the losses calculated in a particular year will carry the market prices of the same year.

Losses due to endemic viral diseases: To study the subject in a proper way, we must have a look at the local & international importance of such an informative knowledge as far viral diseases namely Foot & Mouth Disease (FMD), Rinder Pest (RP), the killer disease, Bovine Viral Diarrhea (BVD) Pest Des Petit Ruminants (PPR), Rabies and other diseases in this group, are concerned.

Foot & Mouth Disease goes beyond veterinary issue and its negative consequences are not limited to the agriculture sector alone but also encompass the livelihoods of rural people as demonstrated recently by the FMD outbreaks in Europe where around 04 million animals were slaughtered in 2001, in order to eradicate the FMD epidemic (FAO 2001). Twenty six percent (26%) drop in milk production, 0.7 percent increase in mortality rate and loss of 23kg body weight per animal was observed in Columbia, as reported by Cardona et al., (1982).

Losses of 3508 millions liters of milk per year were reported in India during 1990 (Sexena et al, 1994), and losses in milk in Turkey were estimated to be 141 million liters due to FMD as reported by Ertan K Nazlioglu (1981). While analyzing the data from FMD outbreak in Sahiwal cattle, reported by Kazmi and Shah (1980) that 70% of the herd was affected, (even though it had been vaccinated previously) and there was a loss of 69% milk yield and 74% body weight in the affected herd. The economic losses estimated through GTZ epidemiological survey (1995-96) were Rs.10.82 billion in Punjab.

In financial terms a direct loss of Rs.400-500 daily, upto 7-10 days means Rs.3000-4000/- or more, plus the animal health care charges of the veterinary Doctor including cost of medication, not less than Rs.1000-2000 per disease tenure, to check secondary infection. The disease has been brought under control to some extent with prophylactic vaccination with Foot and Mouth Disease Vaccine (FMDV) – Once or twice a year. The vaccine and vaccination does not exceed Rs.100/- per animal per vaccination.

More than 50 of the 162 member countries of the Office International Des Epizooties (OIE) have obtained recognition of freedom from this disease. Several countries have eradicated FMD by a combination of stamping out, strict movement controls and vaccination as reported by Woolhouse and Donaldson, (2001). The virus however continues to circulate in two third of the remaining countries thus dividing the globe in to two zones. The situation has significant effect on international trade pattern in susceptible animals and animal Products, also reported by Kitching-2002 Clercq-2006 and Hussain et al – 2004 and elsewhere.

One of the surveys conducted special reference to FMD in large and PPR in small ruminants, indicated the highest incidence of FMD in larger ruminants as 7.78% in a

population of 112810 buffaloes and cattle in the selected villages of all the six districts of Central Punjab. The incidence rates for other diseases of larger ruminants in the same area were found to be repeat breeding (5.28%), hemorrhagic Septicemia (4.97%) Mastitis (4.57%), Idiopathic diarrhea (3.21%), Post Parturient Hemoglobinuria (3.21%), Prolapse (2.97%) and abortion (2.45%).

Rinder pest (Cattle Plague killer disease/Pest Disease infecting large ruminants and specially cattle and buffaloes some wild animals including Yaks. Sheep and goats have also been reported as infected in the form of Pest De Petit Ruminant (PPR). The history of this disease goes back to early thirties in Indo-Pakistan sub continent, Later on, in late fifties when thousands of animals die in the country. Recent history speaks of death of 24 thousand cattle in Sindh while 40 thousands or more died in Northern areas in 1994-95 MINFAL (1996). Emergency was declared, International agencies like OIE and FAO were requested through various TCP projects in terms of provision of consultants, Diagnostic reagents, two million doses of Rinderpest vaccine imported from PAN-VAC. Vaccination of healthy stock started in 3-4 years. A Mega project namely Strengthening of Livestock Services Project (SLSP) was launched, with the assistance of European Commission (EC) which is still operational. The country has since been declared FREE OF RINDERPECT on 27th May, 2007, Lots of efforts have been done. Vaccination has since been stopped. A glimpse of all this effort over 6-9 years can be stated in one paragraph as under:-

“The Participatory Disease Surveillance (PDS) teams worked in coordination with provincial Livestock and Dairy Development Departments (L&DDD) showed that 10,000 (Ten thousands) villages were visited while 1,11,200 farmers were contacted to explore the prevalence of various disease with special concern on Transboundary Animal Disease (TAD) terms and more than 4000 (Four thousand) officers and officials of L&DDDs participated under the guidance of their TADCOs, Directors and Directors Generals of the Provinces as detailed in the Annual Report SLSP and Final Report (2008-09) with the expenditure of 1250 million rupees.

Pest Des Petit Ruminant (PPR) is an acute, contagious disease caused by a Morbillivirus in the family Paramyxoviridae. The disease resembles Rinderpest and characterized by clinical signs and lesions of respiratory and alimentary systems. PPR was first observed in 1940 in sheep and goats in the Ivory coast (Gargadennec and Lalanne, 1942). The early work by Mornet *et al.* (1956) showed that the virus was related to Rinderpest virus. They concluded that it was actually a Rinderpest virus which adopted pathogenicity for goats and sheep. In 1965, a syndrome was described in Nigeria among dwarf goats, which closely resembled Rinderpest and was known by the local name of KATA” and characterized by high mortality with recovering animals developing prominent labial scabs on the mouth (Whitney *et al.*, 1967). A comparative study of PPR and KATA showed that similar intra-nuclear inclusion bodies were also found in the lymphoid and epithelial cells in KATA as were seen in PPR (Rowland *et al.*, 1971). On the basis of morphology, growth in tissue culture, the nucleic acid composition, antigen and physico-chemical properties, the PPR virus classified as the fourth member of the genus morbili-virus of the Paramyxoviridae family and grouped together with the canine distemper, human measles and rinderpest viruses (Gibbs *et al.*, 1979). PPR occurred in Africa (south of Sahara), the

Arabian Peninsula, most of the Middle Eastern countries such as Jordan, Israel and Lebanon including India. The disease had been reported in Pakistan on the basis of clinical signs by Athar *et al* (1995) and Pervez *et al* (1993). One report by Ayyaz *et al* (1997) described the signs, epidemiology and treatment of highly fatal form of pneumoenteritis which affected goats of all ages and breeds in Dera Ghazi Khan, as reported by Khan *et al* (1996).

For the first time in Pakistan Pervez and co-workers reported Rinderpest like disease in goats in Lahore during November 1991 to August 1992. Later, in 1995, based on typical clinical observations on goats, it was reported by the department of clinical Medicine and Surgery, University of Agriculture, Faisalabad during one and half year's period from December 1991 to July 1992 that of the 727 clinically ill goats brought to the University clinic samples were taken from the outbreaks collected by veterinarians, occurring from various districts of the Punjab. Goats from all breeds and all age groups represented the cases but severe form of disease was recorded in Barbari goats with 70% mortality and 100% morbidity as reported by Athar *et al* (1995).

Based on the clinical diagnosis, outbreaks of a disease strongly suggestive of PPR were observed in district Dera Ghazi Khan in 1996. Clinically, the disease was highly fatal and marked with stomatitis, enteritis and pneumonic syndromes in goats of all ages and breeds with mortality. Diagnosed PPR in goats is also being done by using counter immunoelectrophoresis. Tahir *et al.* (1998).

PPR is a serious economic problem causing extensive losses in sheep and goats. The disease is most prevalent in animals less than one year of age. The natural disease affects mainly goats and sheep but it is usually more severe in goats and occasionally severe in sheep. The morbidity rate is 100% and in severe outbreaks with 100% mortality. In milder outbreaks, the mortality rate may not exceed 50%.

The economic losses due to PPR Virus had been estimated to be Rs.1800 millions (\$39million) annually, in India as reported by Bandyopadhyay, (2002)

The morbid material obtained was tested on most reliable methods of confirmation of PPR, including pen side test, cELISA and IcELISA. Reporting an outbreak in Rawalpindi city in June 1997, they indicated 80% mortality in goats exhibiting high temperatures (up to 106°F), oculo-nasal serous discharge, erosive lesion in mouth, pneumonia and diarrhea leading to death in 4-5 days. During the year 2000, at least six outbreaks from a government farm, Mianwali, Islamabad Capital Territory (ICT) and Northern Areas were reported to the GCP/Pak/088 project authorities. The incidence rate of PPR thus found was 5.33% in a population of 64723 of both sheep and goats in all the 90 villages of six selected districts of Central Punjab (Hussain *et al*- 2003)

The highest incidence of PPR has been reported in June, followed by July & May 2003 in Nepal. It has also been reported that incidence of PPR varied between districts and regions. The largest number of sheep and goat affected were observed in Western region where 1500 small ruminants were affected followed by Far-Western region, Central

region, mid western region and Eastern region where number of affected animals were found to be 1400, 843, 827 and 100 respectively (Anonymous-2003), Similar findings were reported by Hussain *et al* (2006) in Pakistan. The highest incidence of PPR in sheep was observed in the district Pakpattan (8.4%) followed by Sahiwal (7.1%), Okara (6.4%), Khanewal (5.5%), Faisalabad (4.1%) and Multan (3.2%). No district was found to be free from PPR. The similar trend was also observed in goats but with slightly low incidence rate in the same areas as reported by Hussain *et al* – 2006.

Losses due to endemic bacterial diseases namely Haemoslogic septicemia (HS), Black Quarter (BQ), Anthrax, Streptococcal infections, staphylococcus infections, Brucellosis, Tuberculosis, Chlostridial infections, Mycoplasma infections especially in sheep, the Pleuropneumonia, Salmonella, Shigella and klebsiella infections, neonatal calf mortality etc have also been attributed and reports published.

In Haemorrhagic Septicaemia (HS) in economical terms, there is financial loss to a farmer when at least 6-7 liters of a cow or 8-10 liters milk of a buffalo @ Rs.60-65 per liter in 2009 of cow milk and Rs.70-75 per liter of buffalo milk in 2010. The treatment cost including the services an additional burdon on the farmer. The Veterinary Doctor gets Rs.500-600/- per visit and medication along with services costs of Rs.700-800/- per animal which is the av: cost experienced in Rawalpindi - Islamabad Twin cities.

When **salmonellae, Shigellae and Klebsiellae** get lodged into intestines, flair up, multiply and cause diarrhea, dysentery resulting into dehydration, prostration and some times the toxins attack the Central Nervous System (CNS) and death may occur. In mild infections loss of milk, low productivity, general body weakness and slow recovery (in delayed treatment) might result into a daily loss of additional 2-3 liters of milk i.e. a net loss of Rs.180/- to Rs.220/- per lactating cow/buffalo. This state might prevail upto 5-7 days. Which is Rs.900/- to Rs.1000/- plus the treatment and Veterinary Doctor's fee etc. The actual loss may be more in case of number of animals affected in one premises. The young stock is the most affected.

Economic losses includes upto 1/10th of total production of milk on first day while it may double the second day and if no treatment is started the milk production may be reduced to 50% although feed in take may continue. In the year 2010-11 the average retail of milk was Rs.70/- per liter. Work done and documented of such losses, for previous years have selectedly been included in this paper. It has also been observed that in such symptoms the framers rush for treatment, other wise the infection spreads like an endemic within the herd/flock and the loss increases doubling and tripling.

An **Abortion Disease** caused by **Brucella abortus** in human beings commonly known as **Malta fever or Undulant fever**, affecting adults and children while in cattle and buffaloes affected by *Brucella bovis* (the organism responsible for contagions abortion). Serodiagnosis of blood samples reveal the incidence of this disease. As a treatment the milch animals can be put on prolonged antibiotic treatment. In not subjecting our previous milch animals to screening with an expenditure of not more than Rs.150/- per animal, in any nearest Veterinary Research Institute (VRI), the disease once introduced in a herd

spoils the whole herd, the subject animal must be slaughtered to avoid further spread of this disease most of the farmers are getting benefits from VRIs. Under a separate report 337 sera from various animals species (205 cows, 43 buffaloes, 04 sheep, 83 goats and 02 dogs) were also subjected to brucella serology. Simultaneously 186 human sera were subjected to serodiagnosis and results communicated to the requestees. In this report 23% cows and 44% buffaloes out of 205 cows and 43 buffaloes, tested in Peshawar area, showed serologically positive results (Anonymous VRI Peshawar 2007-08).

Myco-bacterial infection, (Tuberculosis), a Communicable disease, affects various organs namely intestines, liver, udder, lungs and bones. The cause of tuberculosis in bovines is due to *Mycobacterium bovis*. Incidence can be observed with tuberculin test. Screening of such animals will eliminate positive cases with an expenditure of not more than Rs.150/- each.

Prolonged treatment will continue with anti tuberculous drugs for 90 day and with a gap of one month, for another 90 days, costing thousands of rupees. It is better to eliminate such an animal from the herd. Otherwise selling gifting or auctioning will further become a focus of spread of the disease as reported by Edmonds and Walker (2001).

This is also important for the public health, as a zoonotic disease and its eradication must help in the reduction of high incidence in human beings as reported in the health status and alarming picture of human tuberculosis in Pakistan where every 22' human being is the victim of Tuberculosis in various reports and the Economic Survey of Pakistan 2008-2009. Health Status report, Economic Survey of Pakistan (2007-08) and M/o Health Report (2008) WHO sponsored Seminars and special reports on World Tuberculosis Day Report.

Clostridial Infections include Black Quarter (BQ), Entero Toxaemia (ET) and Pulpy Kidney (PK) disease result in spreading all over the world except few localities and hence is endemic in Pakistan. BQ is caused by *Clostridium chauvei* while *clostridium* preferring causes pulpy Kidney disease. An organism very close to this genus namely *Clostridium Septicum* causes gas gangrene. The disease namely BQ occurs in large ruminants (Cattle & Buffaloes). Symptoms of high rise of temperature, constipation followed by shooting diarrhoea and death of the victims.

The **economic losses** worked out in out breaks are tremendous as the death rate within a flock some times reaches 60-70% young stock are mostly affected. A young calf of 6-7 months with a cost of Rs.3000-4000/- when lost in a farmer's herd, is a direct loss. Number of deaths may be multiplied, (plus treatment), if animal health care is quick. Treatment with antibiotics with veterinary services of a Doctor and production loss may go to a minimum of Rs.1000/- per day per animal. Which otherwise would have not occurred with a prophylactic vaccination of Rs.100/- per animal the maximum but twice a year, with Black Quarter Vaccine BQV.

Clostrium tetani infection causes the disease Tetanus. The infection remains localized, preferably in a wound while the toxins of this organism travel through nervous system reaching the brain and causing vigorous muscular contraction, spasm, high rise of temperature and death. Cases in human beings have always been recorded with a history of

wound, hence after every accident, human and animal patients must undergo Anti- Tetanus Toxoid Serum (ATTS) injection, well in time. This suppresses the spread of *Cl. tetani* toxins.

Economic losses are observed is the **death of the victim**, hence efforts must be made not to overlook the history of wound which can otherwise be avoided with cleaning of wounds & ATTS injections for a few hundred rupees. Death of animals is a direct loss to the farmer. If a farmer had only one milch cow or buffalo and this animal was the sole source of his livelihood. He lost his livestock wealth.

Anthrax, a Killer disease and a communicable disease is endemic in sheep in Pakistan. Cattle have also been found died due to anthrax. This infection is caused due to *Bacillus anthracis*. Sudden death is always reported. Dead animals show bleeding from natural orifices. The blood however NEVER CLOTS in such cases. Slides are prepared from such blood. If anthrax organisms are found, no post mortem is conducted as being a communicable disease to human beings. One mature sheep/goat lost means not less than Rs.7000-8000/- in normal market days while in Eid-ul-Azha the rate has been reported as Rs.12000-14000/- each. The number of deaths can be that many times loss to a farmer. Prophylactic vaccination with Anthrax Spore Vaccine (ASV) has been advocated, may be once a year, prior to or after the Monsoon rains. The minimum cost of vaccination per small ruminant is not more than Rs.50/- each while in large animals upto Rs.60/-. This includes Animal Health Care charges of the vaccinators.

Contagious Caprine and Ovine Pleuro Pneumonia in sheep and goat is a disease caused by mycoplasma organism with the symptoms of pneumonia, high rise of temperature, nasal discharges and bronchitis. Young stock in sheep and goats may not respond to treatment but with higher antibiotics upto 5-7 days. Deaths have always been reported. Prophylactic vaccination with contagious caprine and ovine pleuro-pneumonia vaccine (CCOPPV) has always resulted with protection against the disease once a year. Economic losses of Rs.500-600/- per day for treatment & veterinary services per sheep/goat, in a flock.

A study of **Neonatal calf dysentery (Ncd)** needs to be added in area of calf mortality put forward by T.Zaman et al (2006) conducted in 864 Nili-Ravi calves born during 1993-2000 with an over all mortality of 9.4%. The highest mortality rate was at the age of 3-5 week (3.5%) and Summer Season (11%). Morbidity and mortality due to various diseases was Neonatal calf Diarrhea (16.6%), followed by pneumonia and pneumo-entertitis, Mange (3.4%), Navel ill (3.1%). The author supported the findings that 20% NCD can reduce net profits by 38% and stated that mortality in neonatal calves has mostly been attributed to infectious agents like enteropathogenic *E. Coli* (EPEC), *Salmonella* Species, Rota virus, Corona virus and cryptosporidium while other causes include immunodeficiency, seasonal effect, difficult parturition including health and nutritional status of the dam.

Losses due to endemic parasitic disease one important aspect of economic losses is always attributed to parasitic diseases. Internal parasites (helminths, Trematodes, Cestodes, Lungworms and blood parasites namely *Babesia* and *Trypanosomas* including anaplasmas and Piroplasms should never be overlooked. Simultaneously external parasites

namely ticks, mange mites, warble fly flees and lice etc must also be give due consideration.

An easy way to work out the monetary losses in rupee term when treatment is given, after laboratory confirmation has been made, the improvement in production parameters such as milk increased per day and weight gain per day would have been the actual consecutive loss both to the farmer and to the animal itself as can be seen in the cattle and buffaloes $\frac{1}{2}$ liter milk per day has been observed increasing in a single deworming done, with an anthelmintic of choice, based on faecal examination. In conditions where apparently no bacterial, viral biochemical, shipping fever as well as balanced diet and other environmental factors being constant. This observation was based on few such cases in Rawalpindi-Islamabad twin cities with the history of herd infestation. These infestations are communicable to human beings.

Economic losses have been observed as loss of 2-3 liters of daily milk in both much cows and buffaloes for many days, until treatment with anthelmintic of choice, the recommended based on faecal examination. One can imagine if there is a loss of Rs.180-220/- per day for say 7-10 days or more to a farmer together with loss of wt. gain and loss of productivity. Periodic de-worming twice a year is always recommended.

In cattle a loss of 200-210 gms of beef production has been observed by many workers. Lot of research work has been done in various M.Sc(Hons) thesis of various Universities and published in various Journals of Veterinary and Livestock Sciences in the country. Similar Symptoms in sheep with greater intensity while in goat with lesser intensity have been observed in many areas of the country.

In addition to loss of milk production loss in terms of weight @ at least 110 gms daily mutton production has also been observed in many studies. This is another direct loss to the farmer together with the damage of the potential of the infested victim which may some times regain its vigor or not.

The tape worm or cestode infestation is endemic in many parts of the country. This is also communicable to human beings and vice versa. Tape worms are diagnosed in faecal examination as apparent symptoms many little be observed. Some times segments of tape worms are passed with faeces and hence the farmers complain, the prevalence. Economic loss in the form of $\frac{1}{2}$ - 1 liter of milk, as commonly observed with less % of growth of body wt, and other symptoms with heavy infestations not recorded, when other conditions of Nutrition (fodder, feed supplementation and water) environment and Good Management Practices (GMPs) in apparently healthy herd/flock are normal.

Economic losses include 3-4 liters of milk per day per animal has been recorded in various parts of the country, with continuous decrease in milk production day-by-day if treatment is not provided in time.

Haemo parasites of large and small ruminants include Babesia, Theileria, Piroplasma, Trypanosoma and anaplasma etc. These organisms are very close to or attached with the RBCs resulting in their damage of RBCs and anemia. Some times high rise of temperature

specially in anaplasma, is recorded, with blood in urine and also called "Rat Mootra" (Red Water). The losses due to piroplasma and anaplasma infections observed are decreased milk production and rarely dis-galactia (No milk) upto the treatment. Treatment takes 2-3 days to contain, conveillacence and recovery may last upto one week.

The imported milch animals specially Freisians Jersey, Dairy-Short Horn and/or Illawara Short Horns need glucose-saline drips for 3-4 days as these animals stop drinking water and remain off feed. Some-times jaundice also develops as has been observed.

Leptospirosis, Borelliasis and Treponemaisis are the main spirochaetal infections/diseases of farm animals and man. This chapter needs to be discussed in detail but we need to understand what type of diseases are caused and what economic losses are faced by the farmers and what should be the precautionary measures adopted by the farmer.

(i) **Leptospirosis** is a disease causing Recurrent Fever, rare abortions, mostly Jaundice and kidney diseases. Similarly affections in cattle, buffaloes to greater extent and in sheep/goats to lesser extent, communicated through rodents Human beings are no exceptions. The disease causes recurrent fever, icteric Liver and jaundice including febrile conditions. The disease is observed in rice growing areas where these spirochaetes keep growing but in acidic PH of the soil water. Serological diagnosis reveals the incidence and hence the animal is put on prolonged treatment with higher antibiotics of choice. Fourteen (14) Sero-vars of Lepto-spires are important with further sub types. Out of these 12 serovars are responsible for disease in man and 8 sero-vars affect cattle including other animals. Details can be seen in the recent editions of text books of Microbiology and Vety: Medicine. Lepto-spirosis Serology was carried out at VRI-Peshawar and work is available in other Laboratories and well documented in Masters Thesis Research (Hafeez *at el* - 1990-91).

Economic losses can be observed when febrile conditions and abortions take place. Loss of one offspring means loss of an expected animal. It is not a matter of few thousand rupees but the aborted animal may become carrier and danger to the herd/flock or the area where many animals are affected simultaneously. The disease spreads through contaminated fodder and drinking water. Treatment with antibiotics of choice for one week to 10 days improves the condition of the animal.

(ii) **Borellia type of spirochaetes** mostly affect poultry birds to a greater extent lesser extent symptoms in cattle, buffaloes, sheep/goats are rare until diagnosed in the laboratory. Seven (07) serovars are important most of them are responsible to cause re-curent fever in human beings farmers must be careful not only to their livestock, but to the human beings working at the farm for such infections. Antibiotics of choice can lead to the disappearance of the symptoms. In case of re-currence - repeated therapy may be resorted.

Economic losses can be easily worked out when no other symptoms of any disease are observed and animals (cattle, buffaloes) specially dogs at farm/Kennel are diagnosed sero-positive. Immediate improvement takes place with treatment. Borellia infection is trans-communicable hence is an important disease to be attended quickly with a few hundred

rupees treatment, the farmer can be saved from a loss of declaring the affected animal as potential source of infection in the herd/flock and, of course, human beings which is for greater monetary loss for many months.

(iii) **Treponema** type of **Spirochaetes** affect not only cats and dogs but also hogs which is a potential source of infection as a carrier in hogs it causes diarrhea, the species responsible being *Hyodycentrae*. Luckily no hog farming is done in our country, as being Muslim country, hog is Haram in our religion as clearly mentioned in Al-Quran. The meat of pork also not permissible to Muslims. **Treponema** infections have been affiliated causing peri-odontal infections and gingivitis (the *T. Pellidum* being the causal organism) Losses due to **treponemas** is yet to be worked out where infection prevails.

Trypanosoma infestations always remain limited to horses, dogs to a greater extent while cattle sheep and goats have rarely been diagnosed for **trypanosoma** infection. The disease symptoms include break down of RBCs, anaemia, some times Red- Water with rise of body temperature, the common name of this disease is Surra in horses caused by *T. evansi*. Losses due to this infection can be judged by the fact that animals (horses, mules and asses) seldom work, keep standing, unable to carry load where such services are needed immediate lab: diagnosis will reveal the disease and treatment of choice may be carried out.

Similar organism but different species causes **Sleeping Sickness** in human beings in most of the African countries. The predator parasite namely Tsetse fly which is potential carrier. Human beings victims of this disease become sluggish, drowsy, no work. confined to bed with all other symptoms of anaemia and fever. Laboratory diagnosis reveals the disease and antibiotics of choice must be taken well in time.

Loss of vigour loss of earning days (8 hours daily) and even no work to look after the Dairy animals. sheep or goats) altogether is direct loss to the farm owner / the farm management and sickness of human beings, including cost of medicine and veterinary services.

External parasites namely ticks, mange mites, lice, fleas and warble fly are the main subjects of discussion in these paragraphs. Most of these external parasites are endemic in the country and need immediate attention in case of localized spread at a farm, in a herd/flock or in a locality. These are not only important in cattle, buffaloes sheep, goats, horses, donkeys, dogs and cats, poultry including camels but also the premises such as dairy sheds, sheep/goat pens poultry farms, the bedding the poultry litter and even the nearby agricultural fields. Economic losses are greater when we go through individual infestation scenario as detailed in the coming paragraphs.

Ticks are spread in many countries, localized to herds/flocks and farms. These are found in Dairy farmers (both cattle and buffaloes), sheep and goat farmers and pens, poultry farms (in layers, breeders, broilers and feed stores) dog kennels while in lesser intensity in horses, mules and camels. These have been reported from Aviaries and Zoo animals. Tick infestation have not only caused damage to the skin tissues but cause continuous itch, suck blood, develop mange, decrease milk production, restlessness and localized allergies.

eczema may become weeping and secondary infections may also take place. The skin is damaged and a loss to the farmer and traders alike.

Lice Infestation, despite continuous and excessive use of acaricides and parasiticides in large and small ruminants, rarely exists in various dry and cold parts of the country. A recent study conducted by Mahrukh Kakar and Juma Kakar Sulemankhel (2009) reveals 38.3% out of 909 cows and 41.2% out of 671 buffaloes showed prevalence of different types of lice. This work was conducted in 2006. The study recommends that animals be subjected to watch and periodic spray of insecticides be used periodically. Similar studies conducted in District Dir by Azam *et al* (2002) showed the prevalence of lice infestation, along with other parasitic infestation, in buffaloes.

Losses due to endemic parasitic poultry diseases.

The greater losses have been occurring due to bacterial and endemic parasitic poultry diseases. This is a part of the text book endeavored by the Author-“Economic Losses due to Livestock Diseases in Pakistan” Pages 125-238 (Hafeez.M.2010). Observations be made to assess the economic losses in poultry due to parasitic diseases and Fungi as detailed in some of the reviewed work.

The farmers are always speaking of **coccidiosis** in the same farm as was observed in previous batch and that the farmer used 4-5 times of 1-2 kgs each of coccidiostat in the control of coccidiosis in the previous batch which costed him at least 6000-7000 rupees. A simple example of control of an out break of Coccidiosis in 3000 birds (one flock in one shed) may cost a farmers using 4-5 kgs (4-5 tins/packs) of Coccidiostats, upto Rs.6000-7000/- if action is taken in the very first 20-24 hours. Otherwise the second or third day, the disease might have spread 3-4 times, in the same shed giving a loss of Rs.12000-15000/- which would have been saved otherwise. This is the case in one shed out of 47000 poultry farms where 1/3rd of the number of farmers have two and/or double sheds.

Losses at farms with greater number of birds can well be imagined, if precautionary measures not adopted. Various reports have been published in Journals of repute and elsewhere in the Annual Reports of various VRIs of the country where still greater losses per shed are reported (depending on the number of chicks in first, second or third weeks). More so the sale of million of rupees worth Coccidiostats, in the country, is an evidence of control of economic losses due to a single disease, coccidiosis.

Two important **haemo-parasites (Blood parasites) of poultry** have often been diagnosed in various VRI and PRI Shamsabad as well as private sector laboratories in the country. These are: (i) Borelia species specially Borelia anserine falling in the main group of Spirochaetes and (ii) Trypanosoma infestation. Let us discuss these two as these are endemic in organized poultry farms to lesser extent and in rural poultry, in many parts of the country, to greater extent. The prevalence has also been recorded in the diagnosed cases in many publications in the Journals of repute as well as various Annual Reports of VRIs, PRI, NVL, Islamabad and private laboratories, already referred to above.

Spirochaetes specially **Borelia** species have been found in organized farms when randomized diagnosis was conducted but to a very limited number of incidences. Frankly speaking the prevalence was recorded only from where the complaint was received and diagnosis confined in the laboratory. Apart from poultry and geese, a wide variety of animals may be infected, including rats, mice chipmunks, squirrels, opossum, porcupines, armadillos, hedgehogs, foxes and dogs. Susceptibility varies considerably among animal species and from one strain to another of the spirochaete. A spirochaete of geese is due to *B. anserina*, a microorganism regarded by many as identical with *B. gallinarum*. This organism produces septicemia of chickens. Another species *B. theilerie* is associated with an infection of cattle in South Africa but appears to have low pathogenic powers. The spirochaetes are present in the coxial fluid, saliva and faeces of infected birds. Ticks of the first two kinds appear to be the more important in the transmission of the infection to man (Anonymous 1993). Further details are available in recent reference books of Microbiology and Parasitology. The disease has also been diagnosed in various poultry farms in South Asia region as classified under tick born diseases. Spirochaetosis is always evidenced where ticks are a real problem. The differential diagnosis includes Fowl Cholera, Infectious Coryza and some times colibacillosis in poultry, turkeys & geese as reported in various Reports.

The **haemoflagellates** namely **trypanosomes** cause infestation in Poultry, recorded both in commercial as well as Rural Poultry. Reader(s) specially teachers, Research students and scholars are requested to update the author in this aspect.

The **deteriorating effect of fungi causing Mycosis** commonly known as fungal infections are broadly categorized as (i) The superficial mycosis (ii). Cutaneous infection dermatophyto (iii). The subcutaneous mycoses (iv). The systemic mycoses (v). Other Miscellaneous mycotic infections and mycotoxin etc. In the broad based classification, we need to discuss only those mycotic infections which are of importance in poultry namely (a) Aspergillosis (b) Mucormycosis (c) Ornithosis and (d) Psittacosis.

Aspergillosis in other animals has rarely been reported affecting cattle, sheep and/or horses but to the lesser extent, as compared to the epidemic forms in birds. The **economic losses** can be viewed from the following angles: (a) Brooder pneumonia:- Although rare outbreaks are observed but when the incidence(s) are resulting in prevalence and deaths occurred spontaneously 10-25 chicks (from day old to day 05) per 250 chicks/brooder have been observed. In case of further negligence within 3-4 hours and sometimes upto 08 hours the death rate is doubled. (b) Aspergillosis in Broilers: - Growing chicks in 3rd -4th week have some times developed various symptoms attributed to fungal infection. Serious complications mixed infections and Toxic Syndromes have been observed in grown broilers where the cause was diagnosed as fungal infection.

The magnitude of the problems varies from place to place, farm to farm and hatchery to hatchery as reported in various studies carried out and published for the last 10 years please see various volumes of Journal of Veterinary Sciences (JVSc), AUF, Journal of Animal Health and Production (JAHP), of VRI Peshawar, Pakistan Journal of Agriculture Research (PJAR) of PARC including various Annual Reports of VRIs, Lahore, Peshawar

Quetta & PRI's Rawalpindi & Karachi, ASI NARC, and National Veterinary Laboratories (NVL) Islamabad.

Mucor mycosis belonging to the species of *Phizopus*, of low virulence. The causative agent has been isolated in the presence of other mixed infections. Primary infections may occur in lungs affecting bronchial mucosa, leading to lobar pneumonia. Some times these also get entrance in arteries forming thrombosis, infarctions and meningo-encephalitis.

Economic Losses of less epidemic forms have been reported but cases have been identified in 2-3 birds per thousand, in the dead cases, on post mortem examination. If overlooked, losses may be spread within few hours and second day the number of dead birds are doubled.

Infection of the air sac: Infection of the air sacs takes the form of superficial infection of the epithelial lining which becomes thickened and is covered with a mass of green sporulating mycelium.

Nodular infection: In this form of infection tubercle like masses of infiltrated tissue, necrotic in the centre, are formed.

Pneumonic form of infection of lungs: A diffuse infiltrate is formed in the pneumonic form. The lung tissue is consolidated and becomes grayish white in color. This pneumonic form sometimes assumes the epidemic form in chicks and is known as Brooder Pneumonia. The source of infection is usually moldy grains, poultry feed, drinking water or bedding/etc. It has also been observed that the fungus may also invade the egg during incubation. As reported, the pneumonic form results in rapid toxic death, if prevention and control measures are not adopted well in time.

Psittacosis occurs in Psittacine birds while the **ornithosis** occurs in wild birds such as pigeons, gulls and in domestic fowl specially turkeys. The disease is characterized by pneumonitis & encephalitis type syndrome, including toxin production. The production of oedema and haemorrhages in lungs can be attributed to this disease. Post mortem examination reveals the actual prevalence of the disease which may not be overlooked.

The Mycotoxins are reported to be producing various kinds of toxic syndromes in poultry and other farm animals, like nausea, hallucination, severe dermatitis, carcinoma(s), pneumonitis, neurotropic symptoms such as meningo-encephalitis and toxic death. Some of the aflatoxins cause hepatomas in ducklings and poultry with a history of moldy feed.

Economic losses include death of poultry birds, growing chicks in early stages while grown poultry birds also have been recorded with deteriorating effects of mycotoxins. Care must be taken in the feed storages, the observance of hygiene as a tool of Good Management Practices (GMPs) can avoid losses of layers, GP flock and losses in the brooding.

Economic losses due to endemic ailments (syndrome) one important aspect in considering economic losses in large and small ruminants including poultry is the clinical syndromes

not falling under viral, bacterial and parasitic, fungal or other diseases. These are considerable losses to farmers which have rarely been documented. One can easily work out the losses in monetary terms when the syndrome is overcome. Some of the reviewed observations are detailed below:

Apart from the endemic contagious / infectious diseases which threaten the farmers with substantive losses, if control and eradication measures not adopted, a variety of clinical diseases also play deteriorating affect not only in large ruminants but also in small ruminants and poultry. We can divide these clinical Syndrome prevailing in most of the System functioning in the animal body, namely (a) Digestive System, (b) Respiratory System, (c) Cardio-vascular System, (d) Reproductive including Milk production system, (e) Skeletal System, (f) Nervous System and (g) Uro-genital System.

Cases of irregular motors have been seen in cows, buffaloes bulls, horses, mules and donkeys when the farmers have been complaining like fall of fodder from the mouth. Resulting in less intake of fodder, less body activity, and no ad lib. feed and fodder. With a complaint of reduction in production of milk/drop of milk production with-in 24 hours.

Upon examination, it reveals that the animals has irregular Molars which a veterinarian can help assist in RASPING and the animal becomes normal again the milk production will come to NORMAL after 36-72 hours when the milch animal eats to its fill.

The economic losses may be from few hundreds to a few thousand rupees, depending on the number of animals affected.

Tympany and impaction need immediate animal health care. Treatment by mouth is mostly helpful but use of trocar and canula for immediate removal of the gases from the rumen puncturing through left flank provides relief to the affected animals. Experience has shown that medication in the stomach helps cure the condition, otherwise the victim is found dead.

Economic losses observed start from total loss of milk for 3-4 days in severe cases but in case of loss of the animal there is a loss of many thousand rupees. The cost of a milking cow varied from Rs.60,000/- to Rs.70,000/- while a Dairy buffalo which on an Av: is worth Rs.80,000/- to Rs.110,000/-. If slaughtered, in time, might return the cost of only meat taking into consideration of Rs.280-290/- per kg of beef (with bones). It may recover Rs.20,000/- Rs.25,000/- when sold as meat animal. In monetary terms 1-2 days impaction will result in decreased or low production of milk. If an animal used to produce 6-8 liters of milk, if impaction persisted for 24-36 hours or more which means no intake of feed and fodder, the direct loss of one-two liters amounting to Rs.60/- - Rs.120/- per day (farm rate). The personal observation of the author in such cases is a loss of Rs.1400-1500/- (including Vets: Fee, the medicines and loss of milk) per animal. Death has rarely been observed in impaction of rumen as compared to tympany.

Diarrhoea, is commonly observed in cattle, buffaloes (including calves), sheep/goats (including their kids), other farm animals such as horses, dogs and human beings working in a dairy farm!, fattening farm, sheep/goat farm including poultry farm. Once experienced,

it provide direct as well indirect losses to the farmer(s). Economic losses of ½- one liter per day has been recorded and in case of no treatment 2-3 liter per day for 3rd day onward is the direct loss to the owner.

Respiratory system ailments of bovines (cattle and buffaloes) as well as small ruminants observed and recorded namely, bronchitis pneumonia, asthma and other Mixed Respiratory diseases/ailments etc. Let us discuss them in terms of how these affections provide deteriorating adverse health problems in a herd or at a farm.

The endemic disease were prevalent in 30 districts of the country when a baseline survey was commissioned in 2007-2008 under "Strengthening of livestock Service Project" (SLSP), survey. This survey was carried out in 420 villages over a quantum of 12600 house holds including 60 pen-urban areas in 89 Union Councils spread over 330 villages in the targeted districts: of the country. More than 2/3rd of herds showed the incidence of five diseases namely hemoglobin-urea, Black Quarter (BQ) Foot and Mouth disease (FMD), Pneumonia and Enterotoxaemia (ET), the survey report by Saeed et.al (2009).

The endemic diseases must be taken care of, if one has to manage his/her farm of (i) Dairy cattle and buffaloes (ii) sheep and goats (iii) fattening calves for beef production and/or mixed farming as advocated in many reports Research findings. Millions of doses of Bacterial and viral vaccines are being produced and sold to farmers, on cost basis and used as Prophylactive vaccination against these endemic diseases.

In 2-3 days of **bronchitis** there is a decreased milk production up to one liter in cows and up to two liters in buffaloes have been recorded. It has been observed that losses in monetary terms ranged from Rs.2000-3000/- in one attack of bronchitis. This amount included medication, services, and loss milk. In **labored pneumonic cough**, the treatment prolongs to 5-6 days and sometimes more hence the losses may double as observed and reported from many parts of the country. The medicaments included (i) antibiotics for 5-7 days, (ii) expectorants, (a) cough mixtures, (b) saline electuaries, (iii) 10 days messages with iodex, (iv) pain killers and (v) hot fomentations etc.etc.

In **lung worm infestation**, there is no high rise of body temperature (may be an increase by just one °C. The animals especially sheep and goats keep walking, grazing, eating but symptoms of cough with nasal discharge observed. Antibiotics give seldom response. One should immediately click to Differential Diagnosis (DD), call the veterinarian and start treating the affected animals. Improvement will be tangible. **Economic losses** in terms of medication, services, loss of milk and meat production, will be minimized with continued treatment (which otherwise were faced by the farmer) upto Rs.1500/- to Rs.2000/- in 2-3 days. This is an ailment which provides loss in individual animals but in groups it becomes a community syndrome within a herd or shed. When infections agents are involved such as bacteria, viruses, fungi and or gaseous forms of vapors, (saturated with chemicals). There are five different types of pneumonia observed and recorded in large and small ruminants namely: (i) Lobar Pneumonia (ii) Lobular Pneumonia (iii) Broncho-pneumonia (iv) Double pneumonia (v) Purulent pneumonia and (vi) Chronic Pneumonia and documented in various reports.

Economic losses due to pneumonia can be observed as (i) Milk production decreased to more than 50%, (ii) No gain in body wt,; rather growth of body wt stops (iii) Animal loses body wt: day by day, (iv) Food intake may start from 3rd day on wads, till recovery with treatment, (v) A single animal may show a monetary loss of Rs.2500/- to Rs.3000/-. This comprises medicament, veterinary services. Loss of 3-4 liters of milk per day, (vi) If more animals are involved, loss can be worked out accordingly, (vii) Pneumonia spreads to other animals in a shed, herd or farm quickly. In sheep & goats (i) Low production of mutton (in the days of the syndrome) (ii) Low wt: gain or NIL growth rate in the period of ailment. (iii) Death of newly born kids, a direct loss to the farmer), (iv) Medication expenses, veterinary services, (v) Spread of pneumonic syndrome in the farm, flock or a shed.

Clinical ailments in milk production

Two important clinical affections have mostly been observed and recorded in Dairy animals as well as in sheep and goats.

a) Mastitis (Bovine Mastitis) In dairy cows and buffaloes have been observed and reported many thousand cases each year in various Annual Reports of VRIs Lahore, Peshawar, Quetta and NVL including Divisional diagnostic Laboratories of the country.

Economic losses, can be assessed as (i) If one teat is involved there is loss of 1/4th of the total milk produced per day/and per time. (ii) If the ailment persists, with careless management or neglect, second nearest teat is involved, there is a loss of 50% or 1/2 of the milk produced. (iii) Within one weeks time rest of the teats get involved and damage to the udder is continuous, (iv) Immediate animal health care must be provided otherwise one or two teats can be lost within a week to 10 days. (v) In monetary terms a buffalo giving 7-8 liters of milk per day (if one teat is suffering), two (02) liters of milk daily is lost @ Rs.70-75/- per liter similarly, if two teats are non-functional, 50% milk is gone i.e. 3-4 liters (vi) Cost of treatment, animal health services which goes to Rs.2000/- to Rs.3,000/- per week (including two intra-mammary tubes) per day for one teat, iodex message and additional antibiotics (vii) Improvement is possible if early stages of mastitis within 24-36 hours, is taken up otherwise milk is lost, the precious milch animal is lost except slaughter/meat purposes. In time treatment can save the other three (03) teats, if the farmer/owner is animal loving, sacrifice of one teat is bearable but with a loss of 1/4th milk till the potential lactation of milch animal for 7-8 births.

Milk Fever is a condition or ailment which is known as Metabolic Syndrome or Deficiency Syndrome. This ailment is observed and recorded in good milch cows as well as good milch buffaloes, immediate after birth, within 24-36 hours. It has also been observed in any month, post parturition, in rare cases.

Economic Losses can be enumerated as (i). Quick stoppage of milk is a direct loss to farmer. (ii). Decreased or Nil let down of milk (iii). Milk production loss of one time zero milk (iv). Second time milk depends on treatment and/or intake of feed/fodder to ad. lib status-No milk to the calf. (v). In monetary terms. If a buffalo produced 8 liters of milk/day and no milk (say for 0-3 times) @ Rs.70-75/- per liter, there is a direct loss of Rs.900/- to

Rs.1000/- per day (Farm rate), while in Rawalpindi-Islamabad Twin-cities, this loss was @ Rs.70/- per liter per day, totaling a loss of Rs.700/- to Rs.800/- per day. Medicament and veterinary services may cost Rs.2500/- to Rs.3000/- per case (The medicines included calcium Boro-gluconate + Dextrose Mineral and vitamin D Intra-venous), but the recovery for normal milk may taken 3-4 days, subject to complete feed and fodder intake.

Haematuria and Hemoglobin Urea, Syndrome are prevalent in many parts of the country as observed and recorded in various Annual Reports of VRIs Peshawar, Lahore, Quetta, NVL and also reported in base line survey report of SLSP (2009). Technically speaking blood is secreted in the urine while maturation, also observed by the author many times, at various places in the country.

Economic Losses can be observed as (i) Decreasing body' wt: and loss of blood leads to low milk production (ii) In 2-3 days 1/4th. milk may be lost. (iii) When no attention is paid, the animal may fall down with 1/3rd milk lost a direct loss of milk as well as body condition (iv) Less milk for the newly born calf. (v) Expenses on Medicament (Vitamins + minerals by injection and feed-premixes, by mouth) animal health services may also cost a direct loss of Rs.2000-3000/- per 2-3 days. (vi) In non-recovery cases double the amount of loss will occur in next 3-4 days. (vii) Milk production may come to **normal** within 5-6 days, post treatment. The milk lost will be an additional loss.

Abortion Syndrome has been observed in many parts of the country, in cattle as well as buffaloes. Various categories of abortions at different tri-mesters have been reported and recorded. Abortion is defined as premature birth, an early delivery or fall of offspring before time (mis-carriage) as most of the text books of reproductive physiology denote it.

Economic Losses can be observed as (i) A common saying in animal breeding and reproduction is versatile, One abortion means loss of one crop. (ii) It is just possible that the aborted male fetus might have proved a potential superior bull. (iii) It is again possible that the female (aborted fetus) might have proved a potential good milk producer. (iv) It is well understood that a buffalo bull is produced in 28-30 months and the estimated feeding as well as Management expenses amount to Rs.90,000/- to Rs.100,000/- were in September/October, 2010. The rates in the year 2011 were Rs.145,000/ & Rs.150,000/- market rates. Similarly a buffalo heifer produced to become first calver within 25-28 months with a production cost of not less than Rs.70,000/- to Rs.80,000/- with an average production of 10-11 liters of milk.

Economic Losses due abortions of sheep and goats indicates loss of one male ram or buck/female offspring is lost. The cost of feeding of one mature sheep/goat for 10 months to one year came to almost Rs.6000/- to Rs.7500/ in 2009-2010.- while the sale price on Eid-ul-Azha days was Rs.10,000/- to Rs.12,000/- in 2010-2011 a direct loss to the farmer and sometimes the aborted sheep/goat may not give birth again.

Message to sheep/goat farmers, having studied a brief account of losses due to ailments prevailing in our area, farmers must get a clear message that (i) Digestive system ailments must be attended quickly such as indigestion. diarrhea, impaction of rumen and other

affections to avoid economic losses. (ii) Farmers maintaining flocks of sheep/goats must be vigilant about Respiratory ailments such as bronchitis, pneumonia and other related affections, (iv) It is emphasized that Good Management Practices (GMPs) must be implemented and the atmosphere of better hygiene must prevail to avoid repeated cases of affections. (v) the prophylactic vaccination against HS, BQ, ET, Anthrax and FMD must be carried out in time.

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NB-There are 183 references, available which can be obtained on request.

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ADDENDUM

Sr. #	Page	Para	Line	Incorrect	Correction
01	iii	01	03	is	has
02	ii	04	03	dye	due
03	ii	04	04	rally	deleted
04	ii	06	01	ISA	deleted
05	137	03	01	projects	project
06	138	03	01	Eth	the
07	139	03	05	wass	was
08	139	05	04	karoor	kasur
09	140	01	02	available	availed
10	140	03	02	pages	pp
11	141	04	01	dsy	Dys
12	145	03	06	Non	None
13	148	03	01	through for	through out
14	148	Ref.046	03	pages	pp
15	156	01	35	discussion	discussed
16	156	01	38	expertise	expert
17	162	02	02	HCL	Hcl
18	167	05	06	live	line
19	168	04	02	animal feed	minerals
20	171	05	01	Aqueous	Aquous
21	180	03	02	so	deleted
22	180	03	05	donations	donation
23	180	04	13	prefers	prefer
24	180	04	15	It is	They
25	180	04	16	This	and
26	180	05	01	In Vox Sangunis	In another study in Vox Sanguins
27	180	05	03	Gonealez	Goncalez
28	180	05	03	mostly	that mostly
29	180	05	04	varus	virus
30	181	02	03	collected	Deleted
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