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PAKISTAN JOURNAL OF LIVESTOCK SCIENCES

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2008

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2012

ISLAMABAD – PAKISTAN

PUBLISHERS:
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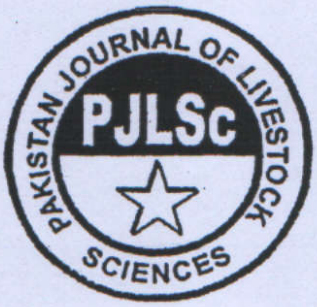

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KEY NOTE BY THE PATRON IN CHIEF

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

I feel tremendous, delight and satisfaction at the occasion that The Editorial Board of Pak: Journal of Livestock Sciences (PJLSc) Islamabad have sustained their dedications and this Fourth Volume has successfully been published, as their annual endeavor (in hand).

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) are the efforts of researchers.

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 finally this document, now in hand, is available for students, academicians, Researchers and Administrators within the country and abroad

Indeed, it is also a matter of our moral support and encouragement that the number of clientage which was 83 in the year 2010, has now reached 300+ out of which 21 are international. The increase in clientage is a positive sign of confidence built in the Scientists who contributed in 2008-09-2010-211 & 2011-12 this 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 bringing out this precious document, in the private sector of Pakistan, with limited resources, by an NGO.

May Allah Almighty Bless all of us for this sustained commitment and dedication towards dissemination of research findings of authors to all stakeholders.

Mashook Ali Bhutto
Patron in Chief

EDITORIAL

Bismillah-Ir-Rehman-Ir Rahim

Alhamdo-Lillah This Volume-IV, No.04 of Pakistan Journal of Livestock Sciences (PJLSc) comprising mostly the Research Papers on Animal Nutrition 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 Education & Social Scientist are also welcomed.

Since the Milk prices have shooted up amidst price hike of various commodities, 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. This has been recommended in various forums symposia/seminars and conferences, at home and abroad.

The Editorial Board unanimously 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 valuable time for review and evaluation, putting in grammatical and technical expertise, for further polishing the research papers of researchers of the country.

In this volume-IV (No.4) of PJLSc we have received research papers from Sindh Agriculture University Tandojam, NARC, University of Arid Agriculture AIOU and NGOs. The authors are appreciated for their in time submission of their write-ups.

Appreciations, through 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. Hopefully we are getting the work done ON LINE, soon.

Dr. Muhammad Hafeez
Chief Editor

PROSPECTS OF INVESTMENT IN VARIOUS AREAS OF LIVESTOCK SECTOR IN PAKISTAN

Muhammad Hafeez*, M.F. Khan, and Tabinda Khwaja*****

*President Livestock Development Foundation (LDF) Islamabad and Chief Editor, Pak: Journal of Livestock Sciences, Islamabad.
**PSO program Leader, Small Ruminants NARC LRS, Islamabad.
***Research Fellow PRI – Rawalpindi.

ABSTRACT

The article is based on a review of Livestock Sector Development in the country for the last one decade (2001–2010). Potentials of Livestock Production reportedly have been incorporated Data pertaining to recent developments Breed improvement, milk and meat production, Livestock by-products (hides, Skins, bones & bone products) documented in various write-ups have been gathered. Thanks to the increasing demands, human consumption and purchasing powers of our people, despite price like, has drawn the attention of Administrators & Planners in public intervention towards Mega Dev: Projects, has provided a sigh of relief to the Livestock Farmers. Various Commercial Banks have financially supported Livestock farmers and to either with private sector and small farmers investment has resulted in bring by the status of Pakistan as 4th largest milk producing country & 3rd largest leather producing & exporting country of the world. To conclude, this article clearly recommends the broad prospects for investment in various Potential areas of Livestock Sector in Pakistan.

Key Words: Livestock Sector Development, Potentials for Investment – Livestock Industry – Pakistan.

INTRODUCTION

Livestock Farmers were making their individual efforts to contribute towards livestock not only for their livelihood but to keep the continuation of our rural culture of keeping good animals, good producers of milk and reproducing good looking breeds, traditional competition & of course getting good price even in early Seventy when the buffaloes used to be of Rs.3000/- to Rs.3500/- and the cows @ Rs.1000/- to Rs.1500/- and the rate of milk used to be Rs.½ per liter to Rs.1.50 per liter and like was the rate of beef was @ Rs.3/- to Rs.4/- per kg. This picture in Eighties was recorded as a buffalo with 10 liters of milk with an average @ Rs.7000/- and a cow upto Rs.5000/- to Rs.6000/- while the rate of milk. Used to be Rs.3/- to Rs.3.5/- per liter, likewise the rate of beef was @ Rs.6/- per kg.

With the passage of time the market rate of an Av. buffalo producing 10 liters of milk in Ninetees remand within Rs.15000-17000/- while a good producer (7-8 liters of milk) cow ranged Rs.10000/- with Rs.17/- to 18/- per kg of beef.

The shooting up of Prices of Cattle & buffaloes with Milk & beef production in the years 2001 – 2003, recorded were Buffalo (with 8-9 liters of milk) in the range of Rs.30000/- to Rs.40000/- and cows @ Rs.22000/- (Local Breed). The milk market rate was Rs.30/- per liter (mix-milk) and the beef was sold @ Rs.60/- (2001-03) per kg, as reported and documented (in AGRI: Stat:-

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2002) and Livestock & Poultry Market rates (2002 – 2003) various News papers report and Livestock Industry written by Muhammad Hafeez (2008) and (2011) Livestock Economics & Business Management (2009), AFP(2006), and else where.

The recent picture of Livestock has been the real existing fact as documented in many Articles, Journals, Text Books, Symposia, Seminars / Conferences and various projects, reports showing that the trend in still increasing as detailed in table – 1 below:-

Table.1 Showing the average market prices of live animals & Livestock Products in Pakistan.

Sr.#	Item	Year (Average Rates Rs.)					
		2005	2006	2007	2008	2009	2010
1	Live Buffalo (with milk @ 10 liter per day)	40,000	46,000	56,000	60,000	80,000	1,10,000
2	Live Cows (Local @ 8 liter milk)	25,000	35,000	40,000	50,000	60,000	70,000
3	Milk (mix milk per liter)	22	25	30	40	50	64
4	Beef per kg	130	160	190	210	240	290
5	Mutton per kg	280	290	320	350	400	450

Source: Survey conducted by the author as consultant Pak: Livestock Farm Complex – Islamabad. Various News Papers. Agri: Stats: MWFAL, GOP, Islamabad.

Similar increasing trends of the market prices of Feed and Fodder were observed and have been documented in various Journals, Reports, market rates, News Papers and Surveys conducted referred to above.

To study the real potentials of Livestock, their by products and to make up mind towards investment in various areas of livestock Sector an excessive review has been undertaken, searching documents and to bring a clear picture to our reader(s) so that it is proved as an Industry. More so the investor(s) get good margins in each and every commodity, for which investment was been made.

LIVESTOCK POTENTIALS TO DEVELOP AS LIVESTOCK INDUSTRY

Looking in detail of livestock potentials, availability of large bovine population, good breeds, feed and fodder, sheep and goat breeds, growing livestock dairy and poultry sectors in the country alongwith technical manpower skilled persons to run farming business indicates that livestock sector can lead to full fledged industry. Government intervention had been minimum (regulatory measures and development of infrastructure). The infrastructure available to facilitate farmers are:-

i. Federal livestock wing MINFAL GOP Islamabad
ii. Provincial Livestock and Diary Dev: Deptts: (LDDDs) Punjab Sindh, Khyber P.K, Balochistan and AJK / NAs.

iii. Veterinary Research Institutions (VRIs) at Lahore, Peshawar, Quetta, Rawalpindi, National Vety: Laboratories Islamabad, PRIs Rawalpindi and Karachi including Animal Quarantine Deptts. and Animal Sciences Institute NARC, Islamabad.

iv. Private Sector vaccine production units, vaccine importers slaughter house(s), bone crushing units (36), casing units at Lahore, Karachi (42), leather processing industries in Punjab (72), 32 poultry feed mills, 24 hatcheries, 4500 broilers, 34 breeder and GP flocks in the country (2008-10).

v. Export of meat (Beef & Mutton) bone and bone products, casings hides & skins to EU member countries Korea, Japan, Australia and other countries fetching millions of rupees each year.

vi. Per capita availability of milk & meat for human consumption, with steady increase, every year.

vii. Poultry sector alone is spread over almost Rs.200 billion which is today bridging the gap of meat shortage and is playing vital role in providing poultry meat and eggs to our people.

viii. No major disease/out break has been observed for the last one decade (2001-2010), except avian influenza.

ix. Major endemic disease of bacterial, viral, parasitic & fungal origin are being covered under animal health care (Annual vaccinations)

x. Production potential exists in various cattle, buffalo, sheep & goat breeds in the country.

xi. More than 1.5 million people are directly involved in Livestock Sector.

THE GOALS OF LIVESTOCK DEVELOPMENT IN PAKISTAN

The goals of livestock development initiatives and of livestock policy formulation in Pakistan, towards livestock industry, are as under:-

- Alleviate poverty.
- Enhance food and income security.
- Create opportunities for employment and investment.
- Improve access to markets.
- Foster generation and adoption of innovation and technology.
- Increase awareness and management of the environment.
- The students should become practically, involved in livestock management, after completing their studies.

The more specific goals of the private and public sector, agro-business clients, farmers, and other stakeholders obviously deviates somewhat from these overall goals. It is important to frame the rest of allied fields with these development goals in mind. In particular, achieving poverty alleviation (which could be positioned better as an important goal, creating employment opportunities. This will improve access to markets, generate economic activity and re-investment in the economy, achieving macroeconomic growth for Pakistan. This latter point will be shown to be important in addressing the overall goals of the Government of Pakistan in achieving macroeconomic growth and stability while addressing poverty alleviation through livestock industry.

MEGA DEVELOPMENT PROJECTS INITIATED BY GOP IN THE COUNTRY

Following new development projects have been launched in the country during 2005-06 through 2007-08·

i) **Livestock Production and Development for Meat Production** project was of five years duration (2005-2010) and has a total allocation of Rs.1520 million. It is assisting in the establishment of 2590 fattening farms (1040 beef and 1550 mutton), 08 Slaughterhouses and 20 butcheries in Private Sector.

ii) **Milk Collection, Processing Dairy Production and Development Program** Project was of five years duration (2005-2010) and proposed at a total cost of Rs.1588 million. More than 10,000 rural subsistence dairy farmers were likely to enter into the milk marketing chain due to project interventions and 15,000 to 20,000 additional breeding animals of better genetic potential for milk production have become available in the project area.

iii) **Prime Minister's Special Initiative for Livestock Project** was of 05 years duration (2005-2010) and initiated at a total cost of Rs.1992 million. It aimed at enhancing the Livestock productivity through the provision of livestock production and extension services at farmer's doorsteps, targeting 13 million rural poor in 1963 union councils in 80 districts of the country. Its activity has assisted in the production of additional milk and meat to the tune of 12 million liters (0.2 million tons per annum) respectively, after the completion of the project.

iv) **Improving reproductive efficiency of cattle and buffaloes in smallholders production system** Project was of five years duration (2007-2012) with a total cost of Rs.495.15 million. The project aimed at establishment of Embryo Transfer Technology Centre, Semen Production and Processing Centre, Strengthening of Provincial Semen Production Units and Support of semen Production in private sector. The centre will produce 5000 embryo per year for farm use and supply it to others.

v) **Construction of Animal Quarantine Facilities at various places including Northern Area, Wagha Border, Lahore and Khokrapar** a Government of Pakistan funded project with a total cost of Rs.300 million was for five years duration (2006-2011). The project aimed at improving Quarantine facilities and establishing new entry/exit points to facilities trade of animals and animal products.

vi) **National Program for the Control and Prevention of Avian Influenza** was launched at a total cost of Rs.1180.142 million for three years duration and implemented through out Pakistan including AJK, FATA and NAs. The proposed project objectives include "to improve and scale up avian influenza surveillance, reporting and

diagnostics at federal and provincial district levels, Strengthening disease control, outbreak containment and eradication of Highly pathogenic consumers, veterinarians and other stake holders regarding AI, vaccine development, improving veterinary services to enforce national animal disease control measures".

Table -2 Showing the Milk and Meat production of the country

Species	Units	2006-07	2007-08	2008-09
Milk (Gross Production)	**000 Tons**	**40,872**	**42,191**	**43,562**
Cow	=	13,913	14,437	14,982
Buffalo	=	25,465	26,231	27,028
Sheep[2]	=	35	35	36
Goat	=	682	700	719
Camel[2]	=	777	787	798
Milk (Human Consumption)[3]	**000 Tons**	**32,996**	**34,964**	**35,160**
Cow	=	11,130	11,550	11,985
Buffalo	=	20,372	20,991	21,622
Sheep	=	35	35	36
Goat	=	682	700	719
Camel	=	777	787	798
Meat	**000 Tons**	**2,618**	**2,727**	**2,515**
Beef	=	1,498	1,549	1,601
Mutton	=	566	578	590
Poultry meat	=	544	601	652

Source: Economic Survey of Pakistan 2008-09

Table. 3 Showing the Gross production of milk in the country

Species	Units	2006-07	2007-08	2008-09
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Source: Economic Survey of Pakistan, 2008-09

MEAT CONSUMPTION TREND IN PAKISTAN

During 1983 the per capita meat consumption for development world was 74 kg compared to 14 kg and 11 kg for the developing world and Pakistan. This meat consumption grew and the data for the year 1993 indicated a steady increase for the developed world as 76 kg, whereas, relatively larger increase for the developing world as 21 kg and 16 kg for Pakistan. The future challenge for Pakistan is to achieve the growing target of per capital meat consumption to a level 47 kg for the year 2020 as compared to the developing and the

developed world targets of 30 kg and 83 kgs respectively as reported by Delgado et ad (1991) and reproduced in the Report of GOP (2003), MINFAL under action plan vide TCP/PAK/0168 which led to various Mega Development Projects in the country.

Table 4 Showing the Per capita meat consumption (Kgs) including forecast 1983-2020

Countries	1983	1993	2020
Developed world	74	76	83
Developing world	14	21	30
Pakistan	11	16	47

Source: Delgado et al. 1991, Livestock to 2020, the next food revolution & GOP 2003 TCP-PAK-0168 Livestock Action Plan Draft Report MINFAL.

EXPORT OF MEAT FROM PAKISTAN

The export of meat both beef and mutton obtained for the year 2009-10 has been reflected in Livestock Industry by M. Hafeez (2011). In the year 2001 Fifteen (15) registered exporters exported 0.03 metric tons of beef and 0.1 metric tons of mutton with a total cost of US $ 03 lacs (0.3 million) as reflected in the TDAP (2006-07 and 2008-09), rest of the data is available in Livestock industry (2011)

The Livestock Production Research Institute and Universities of the country have conducted quite a few studies to ascertain in beef production potential of indigenous livestock under feedlot fattening regimes. The initial live weight, subsequent growth rate and efficiency of gain are chief factors which influence economical meat production. The carcass yield depends upon several factors such as breed, age, sex and degree of finish. The findings of local studies have suggested substantial lives weight gain and carcass yield from the buffalo and different indigenous breeds of cow calves. This detailed data indicates that there is a considerable increasing trend in the export of red meat e.g. in the year 2004-05 meat worth 15 million US $ was exported from Pakistan while the Export value of meat preparations in the year 2004-05 was US $ 18 million. These factual data and other meat prospects for export were presented in the National Conference on investment opportunities in Livestock Sector at NARC Islamabad. (Pasha T.N. 2006) This trend is still continuing with the expectations to grow more (detailed in Livestock Industry – 2011)

MUTTON PRODUCTION IN THE COUNTRY

Mutton is mainly produced form sheep and goats of the country. Again the production data is spread over provinces but let us have a look of the country's total mutton production. During the period 2006-07 through 2008-09 sheep and goats collectively produced 566, 578 and 590 metric tons of mutton respectively.

GROWTH TREND OF SMALL RUMINANTS

The main purpose of raising sheep and goats is to produce mutton. Sheep population grew @ 1.18% in year 2008-09 when compared with the total population of 27.4 millions with the previous years 27.1 million. Goat population on the other hand grew @ 2.71% when the population of 58.3 millions of the year 2008-09 was compared with the previous year of 56.7 millions. The growth rate recorded in the year 2006 was 3.78% (AFP-2006) being highest in Asia.

RANKING STATUS OF SHEEP AND GOATS

The sheep and goats of Pakistan ranked THIRD in Asia when compared with the small ruminants of china, India, Bangladesh and Iran (FAO-Statistics – 2006) and a great potential attributed to sheep and goat for mutton production in the country, and can play pivotal role in the animal protein source for needs as well as for expert purposes.

POULTRY MEAT PRODUCED IN THE COUNTRY

Last but not the least, considerable quantity of Poultry meat had been available for consumption of our people. Despite exports of Beef and mutton, poultry meat has lavishly been eaten by all men, women, and children. It seems to be a staple food of the mediocre & posh families. Over the years when prices of mutton and beef had been on the rise, it was poultry meat which bridged the gap between consumers and the supply of meat in the country. The poultry meat produced had been 554,601 and 652 metric tons for the years 2006-07, and 2008-09 respectively.

As understood, poultry industry is contributing 4.81% to Agriculture GDP while its contribution in Livestock GDP is 9.84%. The total contribution of poultry meat is over 20% of the total meat production in the country with a potentially sustainable growth of 8.9% annually. Poultry meat is directly proportional to the commercial broilers produced and meat thereof, including culled birds and the breeder flocks (becoming non productive after 3 years).

The day old chicks produced have shown a steady but sustained growth of 9.2% over the previous years which is splitted in two main sectors of poultry industry namely (i) broiler production and (ii) Layer production which need to be discussed separately under the captions of Domestic and commercial poultry. Simultaneously eggs and meat from duck and quils cannot be overlooked. As the day old chicks produced lead to mature poultry birds for poultry meat production.

EGGS PRODUCTION IN THE COUNTRY

Since eggs are the main source of quickly digestible animal product these make a major part of our baby foods, bakery items and other food premises hence eggs are getting importance with equal status in adults as well as children, especially in the breakfasts.

Domestic egg produced were recorded as 3484,3547 and 3611 millions in years 2006-07 and 2007-08 and 2008-09 while eggs obtained from commercial poultry were 6682, 7136 and 7620 millions in the same period showing an increasing trend of growth. If we look at the combined data of the total egg produced in the country, it appeared as 10197, 10711 and 11258 millions with 5% growth rate in the years 2006-07, 2007-08 and 2008-09 respectively as detailed in the Economic Survey Reports of these years).

FODDER PRODUCTION, RURAL DEVELOPMENT AND POVERTY ALLEVIATION

This is a re-investment plan for farmer's fodder production and leads to not only Rural Development but with the involvement of labour, transportation and Dairy production. The local people get directly or indirectly involved and such a model mini-project proposal is flourishing at many Union Councils comprising 5-7 villages each and has been welcomed by the farmer community in all the four provinces, Northern Areas, AJK and Fata.

Farmer's Societies from various heavily populated with Dairy animals have been requesting the Private Sector Organizations specially the PLWO and LDF to prepare similar projects in their villages and livestock farmers are coming up with self reliance based developing their economy, within a Tehsil or a District and getting every appreciation from not only the Local Govt. officials but the L&DD Deptt are interested to interact with the livestock farming societies and providing them animal health care service in organized manner.

INVESTMENT OPPORTUNITIES IN VARIOUS AREAS OF LIVESTOCK

(i) Meat Production (Beef Production)

The annual meat production in the country is 27.27 thousand metric tons. Due to increase in human population, demand for meat is increasing and according to an estimate the per capita demand for meat would be 47 kg in year 2020 against 16 kg presently available in the country. (FAO-2004). The available meat for Consumption is from worn out and unproductive animals with overall low quality of meat. To provide quality meat in the local and foreign markets it is imperative to provide animals with good quality fee. Feasibility of feedlot fattening is improving and according to feed trials conducted in the Central Punjab, the profit margin is around 30%. Ceiling price of meat is a limitation. The meat produced under intensive feeding system cannot compete with the low quality meat in the market. Value intensive feeding through quality cuts and processed meat will ensure better return than sale of raw meat in the market.

During 1983 the per capita meat consumption for developed world was 74 kg compared to 14 kg and 11 kg for the developing world and Pakistan. This meat consumption grew and the data for the year 1993 indicated a steady increase for the developed world as 76 kg, whereas, relatively larger increase for the developing world as 21 kg and 16 kg for Pakistan. The future challenge for Pakistan is to achieve the growing target of per capita meat consumption to a level of 47 kg for the year 2020.(FAO-2004).

Though livestock production is very fragmented and most farm units are small and only 10 percent of the farms in the Punjab hold from 10 to 20 buffalo/cows and 5 percent over 20 heads each. Such units are often run by capable and business oriented farmers who seem to be open to change and eager to adopt improved production practices if these prove profitable. Thus if sufficient incentives and workable production programs are given, their response is quick and positive. In the middle 90's US Feed Grain Council introduced commercial meat production with farmers at Pakistan level and a number of farmers from Punjab and Sindh participated in this program. They produced many 'lots' of fattened animals and were happy with the performance, but felt difficulty in selling the animals at proper price. It is in fact very clear that by giving the producers a price which covers the production costs with a reasonable profit margin, there is no other way to develop a modern sustainable meat production industry in Pakistan.

Pakistan's livestock resources hold considerable potential for increasing the production of meat. It has been estimated that about 6-7 million buffalo/cattle male calves are available every year for feeding. If these calves are raised on balanced fattening diets based on crop residues and agro-industrial by products to live weights of 250-300 kg it is estimated that total beef production could he doubled. The export of mutton and beef has been initiated recently and five to six entrepreneurs are operating meat processing in Pakistan for export purpose. The Gulf States have relaxed their trade restrictions on the export of livestock and livestock products from Pakistan. Exports of meat and meat products have been rising since Oman, Kuwait and Qatar have also eased their restrictions. The export trends and value of meat and meat products in the recent years as estimated by TDAP clearly show considerably increasing in the export of red meat in recent years. (Pasha-2006).

The Livestock Production Research Institutes and Universities of the country have conducted quite a few studies to ascertain the beef production potential of indigenous livestock under feedlot fattening regimes. The initial live weight, subsequent growth rate and efficiency of gain are chief factors which influence economical meat production. The carcass yield depends upon several have suggested substantial live weight gain and carcass yield from the buffalo and different indigenous breeds of cow calves. These studies revealed that there is considerable potential to produce duality beef for local and export energy rations. The economic feasibility of at small scale is also presented in the detailed article (AFP-2006).

Dynamic, progressive meat retailing firms are needed to promote the sale of processed, commercially identified quality meat cuts to the consumers. This pre packed, labeled meat should command a premium price to pay for the extra costs of processing and packaging, as well as for the higher meat quality. Through development of the industry's slaughter and meat processing operations one can obtain more value from the livestock slaughtered. In many places, there appears to be considerable scope for increasing efficiency in the conversion of slaughtered stock into sales of meat and by products.

The value of the meat industry's output could also be considerable increased by expansion in the use of meat preservation and processed product technologies. The result should be growth in the market value, dietary benefits and environmental acceptability of the industry's output. Similarly, the value of the hide or skin may be enhanced by improved handing especially during skinning process. Indeed, hides and skins are the most valuable slaughter by products. The development of a modern beef industry in Pakistan therefore, cannot be started at production level rather at distribution level.

Utility Stores in Pakistan have taken initial steps to sell frozen beef, Mutton, minced meat including poultry meat in collaboration with a frozen meat producing company and set an example paving way for investment in this sector (Hafeez-2006) while M/S METRO Islamabad have also started frozen as well as chilled meat from 2007-08.

MUTTON PRODUCTION

Small ruminants contribute largely to the livelihoods of the livestock keeping households of low and medium income farmers in the developing world. The keeping of small ruminants is mainly concentrated in the developing areas of the world. So small ruminants make up a large proportion of the domestic ruminants in Asia in terms of numbers and contribution to meat production. Asia accounts for 52% of the world's small ruminant population as reported (FAO, 2006).

In Pakistan small ruminants (sheep and goat) are raised by landless or poor farmers with minimum land holding. Pakistan has about 34 goat and 28 sheep breeds (Isani & Baloch, 1996). Majority of sheep and goat breeds in Pakistan are Nachi and Damani are known as dairy goat breed but are not comparable to the improved dairy goats breeds from Europe and North America. The meat supplied by small ruminants as preferred over meat from large ruminants in Pakistan particularly, the goat meat. Moreover the value of goat meat is higher than the meat supplied by sheep and any other livestock psecies such as cattle and buffalo (Khan M. Fatah Ullah-2006).

GROWTH DYNAMICS AND DISTRIBUTION OF SMALL RUMINANTS

Sheep and goat make up a large population of domestic animals in Pakistan. The population of sheep and goat and their overall growth is presented. According to livestock census (1996) and (2006) goat has the highest growth rate of 4.50% per annum among all the domestic livestock in Pakistan while sheep has the growth rate of 1.21% per annum, lowest among the livestock. According to the largest agricultural statistics (2007-2008), sheep population growth is further decreased up to 0.58% per annum whereas goat has maintained its fate. According to the FAO statistics (2006), goats in Pakistan are increasing at a rate of 3.78% annually, which is highest in Asia. The reason for higher annual growth rate of goat is preference of goat meat as compared to other ruminants for meat. Moreover, the higher growth rate of goat population can also be attributed to their suitability to the environment.

SHEEP AND GOAT BREEDS

Pakistan has 28 breeds of sheep and 34 breeds of goat which have been described in detail, in various books referred to, in the end of this chapter.

A lot of variation exists in characteristics among various sheep and goat breeds. Sheep breeds differ from thin tailed to fat tailed sheep and more variation exists in growth production and wool. Similarly, goat breeds, differ in growth, reproduction and milk production. Goats are also kep primarily for meat production. Some goat breeds such as Beetal, Dera din Panah, Nachi and Komori are known as milch breeds. These are breeds whose meat is also most liked in their respective areas, especially Beetal and Kamori. Therefore, these breeds are known as dual purpose. Teddy is a small size breed, which has gained wide distraction and popularity over the last 30 year because of its prolificacy and faster growth rate as described in various documents namely:-

i. AFP (2006). Proceedings of the National Conference on Investment Opportunities in Livestock Sector. NARC, Islamabad. pp-66-81.
ii. Hafeez M. (2008) Livestock Industry code 782 AIOU Book series Unit 07 livestock breeds of Pakistan.
iii. Isani, G.B. and M.N. Baloch (1999). Sheep and goats in Pakistan.
iv. Small Ruminants production – M. Fatahullah (2010).

INVESTMENT IN VETERINARY PHARMACEUTICALS AND BIOLOGICAL

With a very large livestock population and progressing poultry industry demand for veterinary pharmaceuticals is very much there. In fact the total veterinary pharmaceutical market in the country exceeds 500 million rupees annually. Import bill per annum exceeds 200 million rupees. Thus local production of quality veterinary pharmaceuticals is a good investment, avenue in the country. (Nawaz and Rakhshands Nawaz-2006).

More than 120 private sector commercial units are producing veterinary pharmaceuticals comprising anti-biotics, anthelmintics, curatives, hormones, enzymes, mineral mixtures including tonics and heamatinics and other related products duly licensed under the Drug Act – 1976 of Ministry of Health Govt. of Pakistan. The detailed company wise products as well as chapter wise products are already enlisted in the book entitled: Vets guide" First Addition 2002 published by the Bureasu of Agriculture (BAF-2002).

In addition the following Veterinary Research Institutes are producing various bacterial and viral vaccines for livestock and are available for sale on cost basis:-

i. Veterinary Research Institute, Bacha Khan Chowk Peshawar.
ii Veterinary Research Institute, Ghazi Road Lahore.
iii. Veterinary Research Institute, Brewery Road, Quetta.
iv. Poultry Research Institute, Shamsabad, Rawalpindi.
v. Poultry Research and Vaccine Production Centre, Singer Chorangi Karachi.

INVESTMENT IN LIVESTOCK BY-PRODUCTS

Before going into the detail of various sectors of Livestock By-products, it is understood that the following areas are open venues for new investment and/or expansion of the existing various commercial units of the following by-products.

a. Investment in Bone and Bone Products

The overall production of bones in the country as reported in the table 4 Chapter 4 were 652.36, 672.08 and 692.43 metric tons for the years 2006-07, 2007-08 and 2008-09 respectively. The increase in growth rate in the these three years was 3.2%.

UTILIZATION OF BONE AND BONE PRODUCTS

Bones & bone products have multi-dimensional used as under:-

1. Used in animal feed, specially in poultry feed.
2. Used for di-calcium phosphate (DCP).
3. Gelatine Production.
4. Used as organic fertilizer.
5. Used in paint industry.
6. used in cosmetics.
7. Tallow as by-products of boiled bone is used in soap making.
8. Concentrate feed making / pellets / wanda making for dairy animals.
9. Billiard ball preparation and paints.
10. Tooth industry / filling material preparations.
11. Used in medicines both in human & animals drugs.
12. Used in Modulation of-artificial locomotive organs for amputees.

b. Investment in Animal Casings and Guts

In the present write-up, casing are regarded as intestines from large animals (both cattle & buffalos only) while guts are taken as intestines form small ruminants (both sheep and goats only).

- **Casings**

Sheep and goats collectively produced 12.56, 12.98 and 13.43 millions casings during the years 2006-07, 2007-08 and 2008-09 respectively with an increasing trend of growth @ 3.37% annually. A total of 32 casings and guts processing units were registered (25 in Karachi and 07 in Lahore) with MINFAL GOP including the Animal Quarantine Deptt: Karachi and were still operational. Some of thee units claim established prior to the independence of Pakistan.

- **Guts**

Large ruminants namely cattle and buffalos have collectively produced 44.77, 45.78 and 46.82 million gusts in the country for the year 2006-07, 2007-08 and 2008-09 respectively. The 2.26% growth rate showed increasing trend in these years.

c. Investment in hides and skins including leather sector

A total of 725 tanneris/hides and skins processing units were functioning in the 2008 in the country as compared to 112 in 2005 and leather products worth US$ 8590 million were exported in 2005-06 from Pakistan. The total production of hides form (cattle and buffalos) was 12.6 millions while sheep and goats collectively produced 46.35 million skins in the year 2008 respectively.

d. Investment in Other by-products

(a). Wool

Wool is mainly obtained from sheep. Sheering (clipping of wool) is done in twice a year. Spring clipping is done is March and Autumn clipping is done is Sept-Oct, each year.

The Total wool produced in the country, based on the cumulative data was 40.57, 41.05 and 41.54 metric tons for the years 2006-07, 2007-08 and 2008-09 respectively. The increasing growth tend was recorded @ 1.19% over these years.

The MOHAIR from Angora and Pak. Angora goats are taken as wool and it goes to woolen mils for cloth making and other wool industry products in the country. The major portion of the wool is the take from sheep. The wool categories are graded as (i) fine wool (ii) carpet wool and (iii) coarse wool obtained form the twice sharing of sheep in the country. The following four woolen mills are the regular clients of wool produced in the country.

(i) Lawrencepur Woolen Mills Distt: Attock Punjab.
(ii) Bannu Woolen Mills Distt: Bannu, Khyber P.K.
(iii) Harnai Woolen Mills Distt: Harnai Balochistan.
(iv) Quaid Abad Woolen Mills Qadirabad Punjab.

(b). Animal Fat

Animal fat calculation had been a difficult work while estimating the animal fat % in various species such s buffaloes, cows, sheep and goats. Animal fats are also different than milk fat for example, the milk fat for buffaloes remains 6-7% average while the cow milk for remains 3-4% average. But milk fat is not discussed here. Animal fat also varies on animal Nutrition regimen as well as feed conversion potential of individual animal. On the whole the animal fat was taken as 7% of the average caress weight (8%) in Buffaloes while in Cattle this was average as 5-7% rounded as 6%.

In calculation of fats all the fat % of cattle buffaloes, sheep and goats was counted. The fat collected from cattle, buffaloes sheep and goats is obtained from peritoneum, pelvic (organs covered in fats), intra muscular and subcutaneous fats. The total fat produced from cattle buffaloes sheep and goat was 209.14, 215.25 and 221.43 metric tons for the year 2006-07, 2007-08 and 2008-09 respectively as shown in Table 4.1 since the fat % is directly proportional with the domestic animal population subjected to slaughter hence the growth rate gave the increasing trend of 2.93%.

(c). Edible Offals

Edible offals comprise those items (organs) of animals, collected after slaughter, within the slaughter house or at the butchers shop. The include stomachs lungs, liver, spleen, kidneys, testicles, tracheas, aesophagus, left over parts of hides of skins (tail portion, part of head, etc). These items are cleaned chopped, boiled and used as Dog Food I the country. These are not more than 2% in large animals while upto 01% in sheep in goats.

The total edible offals produced in the country were 308, 317 and 325 metric tons for the year 2006-07, 2007-08 and 2008-09 respectively with an increasing growth trend of 2.52%. It is further stated liver and heart including some time tongue is sold in meat prices. Both liver and heart of Bovines (cattle and buffalo) combinedly weight 4-5 kg on average while is sheep and goats heart, liver and kidneys collectively weight upto one to one and half kgs. The main use of edible offals is in dogs food and some of these also go in poultry feed.

(d). Head and Trotters

In the Indo-Pak sub continent in general and in Pakistan in particular, head and trotters (four feet and joints) are cleaned, brain removed and cooked for hours to prepare the traditional morning dish and eaten as NIHARI in almost all Distts and Tehsil restaurants. Brain is also cooked separately and is eaten lavishly as a tasty dish in our area. Head and trotters obtained from cattle, sheep and goats collectively to the tune of 191.63, 196.98 and 202.50 metric tons for the year 2006-07, 2007-08 and 2008-09 with an increasing trend of growth of 2.8%.

(e). Hair

Hair are mainly produced from goats. Unlike sheep, the goats are sheered only once in the year and that too is rare. The hair actually is removed/ cut from the skins in skin processing units with motorized machines. These hair are then transported to hair weaving factories where rugs, carpets and ropes including bags are prepared. The MOHAIR from Agnora and Pak Angora goat are used in the woolen mills for woolen cloth preparation. The total production of hair was 20.85, 21.41 and 22.00 for the year 2006-07, 2007-08 and 2008-09 respectively with an increasing trend of growth of 2.71%.

(f). Blood

The blood is counted as 0.9% of the body wt: of the animals body (large animals and small ruminants) The total blood obtained at the time of slaughter of animals (cattle, buffaloes, sheep and goats) from the slaughterhouses, was 5.27, 5.47 and 5.54 metric tons for the year 2006-07, 2007-08 and 2008-09 respectively the increasing trend of growth was recorded as 2.51% during this period.

(g). Horns and Hooves

These are mostly collected from the butchers shops when bones are also collected. The skins are however colleted immediate after slaughter, through the processing units agents. The total horns and hooves produced (from cattle,

buffaloes, sheep and goats) in the country were 44.5, 45.35 ad 46.68 metric tons for the years 2006-07, 2007-08 and 2008-09 respectively. The growth trend showed an increase of 2.43%.

In bringing all the above information, it indicates that not only livestock main products such as milk and meat but the other by-products are equally important and livestock sub sectors in individual by-products are already engaged. These products are not only catering the national requirements but most of the by-products are being exported from Pakistan handsome amount of foreign exchange is being earned by the traders and the country.

CONCLUSION AND RECOMMENDATIONS

From the above review it can easily be inferred that there is a great potential in livestock sector and prospects of investment, in various areas of Livestock. The areas pointed and above comprise Livestock breed improvement, Milk and Meat production, Livestock by-products, Veterinary biologicals and vaccine production, veterinary pharmaceutical products, Veterinary Services and Poultry Production.

The marketing aspect is yet another area where feasibility based projects are prepared and the Financial Institutions specially the Banks are ready to provide credits for increased milk meat & other by-products for utilization at home and for export purposes.

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COMPARATIVE STUDY OF MARKET TRENDS OF INFLUX OF SACRIFICIAL ANIMALS OF EID-UL-AZHA, MARKET ISLAMABAD

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ABSTRACT

This comparative Study, based on two Gallop Surveys, of 2010 and 2011 Questionnaire, Conducted 3-4 days prior to Eidul Azha in November each year, provides factual data on various categories of large animals (Bulls, Cattle-Calves) and small ruminants (Sheep and Goats). The condition of animals health status, total number of animals pouring in and average prices of individual animals alongwith sold price has been reported. In the year 2010, a total of 156 Livestock owners were enquired including 13 groups/Deras with 06-12 animals, each; 56 individuals with 02-03 animals while 87 individuals had ONE animal each. A total of 1,32,000 (0.132 million) animals were brought to the animal market from 15-17 November 2010 out of which 83000 were registered @ Rs.50/- per animal while 48000 – 49000 Not registered were also seen outside the market. In addition 12000-13000 un-registered /Not recorded animals were seen, roaming about on various roads of Rawalpindi–Islamabad. Two categories of large animals namely Dondas (two-teeth) and Chogas (Four-teeth) were mostly seen brought for sale. Rare cases of apparently healthy animals without permanent teeth (KHEERAS) were seen for sale. The average demanded prices for Dondas (with an average apparent Body Weight (B.Wt) ranged between Rs.70,500/- to Rs.68000/-. One or two days prior to Eid-ul-Azha. The sale prices of such animals were recorded as Rs.60,500/- and Rs.56,500/- while the demanded prices for Chogas (four teeth) were Rs.86,400/- (with an average Body Weight of 200-250 Kgs) which were mostly sold @ Rs.73000/- to Rs.73,500/-, Two –Three days prior to Eid-ul-Azha. The price fell down by 14% to 16% one day prior to Eid-ul-Azha. The day of Haj, afternoon. On Eid day the prices fell mostly by 20-25% in 2010. Various prices of Hides, Skins and slaughtering charges have also been defailed. In the year 2011. The Survey showed increases in prices of Live animals, both Dondas and Chogas by 14-16% while the prices of sheep and goats also showed increasing trends (not less than 15-20%). Similar increase of slaughtering services, and prices of hides, skins and guts/casings were also increased. A total of 260,000 large animals almost Dondas and Chogas while 80,000 Sheep/Goats were brought for sale in 2011. It was observed that the presence of individual animals was more as compared to purchase of two or more, by one party. The purchases were less in 2011 as compared to 2010. The unregistered not recorded animals (Large animals) were not less than 12000-13000 in November: 5th to 7th in the year 2011.

Keywords: Survey Prices of large animals small ruminants sacrificial animal Islamabad Pakistan Eid-ul-Azha market.

INTRODUCTION

Since 1991-92, Sacrificial animals both large ruminants, Bovines (Cattle and Buffaloes) and small ruminants (Sheep and Goats) are regularly brought for sale in the largest Annual Animal Market (AAM) Rawalpindi – Islamabad, in Sector I-12 and H-12 specified for Eidul Azha. The Bovine sacrificial animals are always categorized as (i) two teeth (Dondas) (ii) Four teeth (Chogas) and (iii) Aged six-teeth (Chaggas) etc. Majority of these animals (95-96%) are Males while very less numbers 04-05% are always observed as Females.

MATERIAL AND METHODS

(i). Both the Gallop Surveys conducted in 2010 and 2011 were based on the Questionnaire devised specially for this purpose.

(ii). Three days prior to Eid-ul-Azha were selected for carrying out these surveys each year.

(A) In the year 2010, 14th, 15th and 16th November, were the days for this work while 5th 6th and 7th November were earmarked. Same information was also added on the day after (Questionnaire 2010).

(iii). A total of 13 Deras were visited and information collected alongwith 56 individuals (with 2-3 animals each) and 84 randam individuals (with one animal each).

(iv). A total of 36 Flock owners of sheep, goats with 22 small holder (2-5 sheep/goats) together with 14 comparatively larger flocks with (12-25 goats and/or sheep) were interviewed, totaling the respondents as 72.

(v). A total of 228 (156+72) questionnaire were filled in, recorded all information and subjected to simple statistical analysis.

(B). In the year 2011 similar information was collected as under:-

(i) A total of 12 Deras with 12-18 large animals were visited questioned and recorded on the Questionnaire – 2011.

(ii) In three days 76 individuals owners with 2-3 large animals each, while 84 individual (owners) with one animal each were interviewed. Totalling the respondents as 172.

(iii) Similarly 47 flock owners of goats and sheep were interviewed and recorded on the questionnaire.

(iv) A total of 219 (172+47) questionnaires were filled in and data collected was subjected to simple statistical analysis of comparison, percentages and other approaches etc.

(v) Efforts were made to interview 50 owners and 3-4 deras per day starting 03 days prior to Eid-ul-Azha, each year.

RESULTS

The following information was gathered for the year 2010 and 2011 and is presented below:-

(a) In the year 2010, a total of 258 Livestock owners/ traders responded out of which 156 pertain to cattle and buffalo owners and 72 were sheep and goat owners.

(b) A total of 1,32,000 (0.132 millions) cattle and Buffaloes were brought to the animal market from 15-17 November out of which 83000 (eighty three thousands) were properly registered/recorded (with entry fee paid) while 48000 – 49000 Non-registered were roaming about in the vicinity of the market. In addition 12000-13000 were also noted roaming on the roads adjoining the main market. The average demanded price (ADP) of cattle / calves / bulls for Dondas (two teeth) and Chogas (four teeth) alongwith Chaggas (six teeth) with their average body weight (ABWt) assessed for the year 2010 and 2011 is presented in table 1 below:-

Table-1 Showing the Comparative prices of sacrificial animals at Islamabad - Rawalpindi twin cities Market (H-12) 2010-2011.

Sr. #	Item	ABWt	ASP 2010	ASP 2011	Differ: Rs.	Percent Increase
1.	Cattle,Calves Bulls 02 teeth	150-200	70,500/-	78,800/-	8,300/-	11.7%
2.	-do-	160-180	66,000/-	72,000/-	6,000/-	9.1%
3.	Cattle, Calves/ Bulls (4 teeth)	200-250	80,000/-	90,000/-	10,000/-	12%
4.	-do-	250-300	110,000	130,000/-	20,000/-	18.18%

It was observed that there was a difference of Rs.8000/- to Rs.10,000/- in the ADPs and ASPs in both the categories of Dondas and Chogas while a difference of Rs. 20,000/- - 25,000/- was observed in the ADPs and ASPs (18.18%) with the similar trends of Differences in both the years.

The cost of slaughtering services with cutting of meat and the by-products namely raw hides, skins, guts/casings also showed increasing trends as presented in table-2 below:-

Table-2 Showing the comparative prices/cost of slaughtering services and by-products of sacrificial animals twin cities 2010-2011.

Sr. #	Item	Average Cost. (Rs.) 2010	Average Cost. (Rs.) 2011	Difference (Rs.)	%Increase /Decrease.
1.	Slaughtering & Cutting of Large animal	3,000/-	3,500/-	500/-	16.16%
2.	Slaughtering and cutting (Sheep/goats)	1000/-	1200/-	200/-	20%
3.	Hides	2500/-	2800/-	300/-	12%
4.	Skins	150/-	200/-	50/-	33.33%
5.	Guts	200/-	180/-	20/-	10% (Decreased)
6.	Casings	150/-	160/-	10/-	6.6%
7.	Green Fodder (Chopped)	250/- per 40 Kgs	300/- per 40 kg.	50/-	20%
8.	Green fodder (unchoped)	130/-	145/-	15/-	11.53%

The cost of slaughtering, cutting and skinning was on an average of Rs.3000/- per large animal in the year 2010 while it was observed as Rs.3500/- (average) in November 2011 with an increase of 16.16%. Similar increasing trend was observed in small ruminants slaughtering, skinning and cutting (20%) as detailed in Table-2. Simultaneously the other by-product hides and skins, casings and green fodder on Eidul Azha days as compared

with Normal seasonal days showed an increase of 12%, 33.33%, 6.6%, 20% and 11.53% respectively while the rate of guts from large animals showed 10% decreasing trends.

PRODUCTION AND HEALTH STATUS OF ANIMALS AT AAM.

(i) Most of the large animals upto 80% were Dondas (two teeth), Less percentage were Chogas (12%) and 7-8% were Choggas (six teeth);

(ii) The Breed characteristics as observed in 2010 and 2011 were mixed breeds with light brown and grey colours,

(iii) Dhanni animals with shining skins were also seen upto 28-30% of total population of 136 owners, surveyed.

(iv) Health status was apparently healthy. Majority of the surveyed respondents (91%) revealed that they had vaccinated their animals with Haemorrhagic Septicemia Vaccine (HSV), Block Quarter Vaccine (BQV), and Foot & Mouth Disease Vaccine (FMDV) while (9-10%) did not clearly indicate when their animals were vaccinated or not.

(v) Majority of sacrificial animals (94%) brought to the AAM in the year 2010 and 2011 had no external parasites (Large animals). Hardly 1-2% had warble fly nodules on the back. Specially in non descript animals while 2-3% large animals had ticks/mange mites, out of surveyed animals.

(vi) Majority of the owners had been providing feed and fodder along-with grazing their animals for 2-3 hours daily.

(vii) Less percentage 14-15% responded positively that they had sprayed their animals against external parasites.

Table-3 Showing the average slaughtering rates 8th November, 2011

Sr.#	Items	2010	2011	Increase
i.	**Large animals**	3500/-	4000/-	14.28%
ii.	**Small ruminants**	1200/-	1400/-	16.66%
a.	**Hides**	4000/-	4500/-	12.5%
b.	**Skins**	1700/-	1800/-	05.88%
c.	**Casings**	145/-	160/-	10.34%
d.	**Guts**	162/-	170/-	04.93%

Table-4 Showing the situation of Eid-ul-Azha Market at Bhara Kahu, Islamabad November 2011 (6-7 November, 2011)

Sr.#	Items	2010	2011	Increase
a.	Number of large animals brought for sale:	176	Bulls	Both Cows and Buffalo Bulls
i.	Buffaloes	83	Dry	--
	Total	159	28 Haifers	--
ii.	Small ruminants	45		--
	Total	**204**		

Table-5 Showing the total # Sheep & Goat Roaming Pirwadhai Market link road.

b	No. of Small ruminants		ADP (Rs.)	ASP (Rs.)
i.	Sheep Flocks	38	14000/-	12000/-
			11000/-	9000/-
ii.	Goats Flocks	137	13000/-	11000/-
			10000/-	8000/-
iii.	Cattle Herds	82		
iv.	Buffaloes	30	80,000/-	66000/-
vi.	Buff/Calves	52	55000/-	51000/-

SUMMARY OF GALLOP SURVEY OF LRGE ANIMALS BROUGHT TO RAWALPINDI – ISLAMABAD – TWIN CITIES ANNUAL EID-UL-AZHA, MARKET 15-17 November, 2010.

- A total of 230 Livestock owners Surveyed.
- 21 Groups/Deras Responded out of 36 Deras.
- 164 individuals asked questions.
- 62 individuals had two animals each.
- 102 individuals had one animal each.
- 1,32,000 total animals brought in the market.
- 83000 animals registered with Rs.50/- per animal.
- 49000 – 48000 Not registered.
- 12000 – 13000 additional unregistered animals found roaming about on Roads (i) Dhoke Hassu, (ii) Railway road, (iii) Dhoke Ratta, (iii) Pir Wadhai road, (v) I-10 roads and Khayaban area.

Sr.#	Average demanded rates (ADR)		
a.	Dondas (140-160 kgs)	70,500/-	10050/-
b.	Chogas (200-300 kgs)	10050/-	73,500/-
	Average Sold Price		
a.	Dondas (140-160 kgs)	60,500/-	9500/-
b.	Chogas (200-300 kgs)	73,500/-	13000/-

Average Demanded Price ADP, ASP and Difference.

Sr.#	16th November	ADP	ASP	Difference
a.	Dondas	68,000/-	56,000	12000/-
b.	Chogas	73,400/-	56500/-	7000/-

Sr.#	EID DAY	ADP	ASP	Difference
a.	Dondas	61,000/-	48,000/-	13000/-
b.	Chogas	65000/-	53,000/-	12000/-

Table-6 Showing the 2011 Average rates (ADPs) & ASPs of sheep and goats

Average Wt. Age	ADPs (Rs.)	ASPs (Rs.)
30-35 kgs – Sheep upto one year	14000/-	9500/-
30-35 kgs – Goats up to 18 months	12000/-	9500/-
25 kgs. – Goats up to one year	11000/-	7500/-

Table-7 Showing the rates of slaughtering hides/skins, guts and casing 2010-2011

Sr.#	Slaughtering rates	Average (Rs.)
01	Large animal	3000/- to 3500/-
02	Sheep / Goats	1500 to 1600/-
	Hides and Skin Rates	
01	Hides	3500/- to 4000/-
02	Skins	1300/- to 1500/-
	Casings and Guts.	
01	Guts (Large animal)	200/- to 180/-
02	Casings	110/- to 120/- 130/- to 140/-

DISCUSSION

Eid-ul-Azha markets, where sacrificial animals (majority males) and brought for sale, have become traditional, cultural and Religious Annual event of Muslim World specially in our country. In addition to 112 weekly animal markets (42 in Punjab, 22 in NWFP/Khyber P.K, 24 in Sindh and 24 in Baluchistan) (Hafeez 2008), three major markets have become famous for Eid-ul-Azha namely, Karachi, Lahore and Rawalpindi-Islamabad. The Gallop Surveys are conducted jointly by Pak: Livestock Welfare Organization® (PLWO) Islamabad and Livestock Development Foundation® (LDF) both PLWO and LDF have since been merged in one LDF (Regd) w.e.f. October/November, 2012. This survey study based on a questionnaire gives us the comparative picture of trend of prices both ADPs and ASPs, in various categories of animals, specially Dondas, Chogas and Chaggas. The increasing trend in prices of 2011 as compared to 2010 have many reasons told by the individual respondents. The first and the fore most being the feed and fodder cost followed by cost of transportation and increasing costs of manpower and miscellaneous expenditure, (Dera, Tentage, Shelter and the arenas within the market) etc.

The difference between the ADPs and ASPs has not been greater as compared to other bigger Annual Animal Markets of Lahore and Karachi as reported in the Newspapers and electronic media/TV etc. (Documentaries of various Channels on 5th, 6th and 7th November 2011.

Cost of slaughtering, cutting and skinning has also shown sustained increase over the previous year(s). The prices of by-products have also shown increasing trend which is not dropping with the passage of time. We have to pay attention towards increase in Livestock (Live-animal) Production to meet the future demands of Not only our animal Protein requirements (from Mutton and Beef) but we must also produce more healthy and fattened sacrificial

animals for catering the demands of our own people, as advocated in many text books, Journals and Pak: Economic Surveys of recent year.

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ECONOMIC LOSSES DUE TO BACTERIAL AND VIRAL DISEASE OF POULTRY BIRDS IN PAKISTAN

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ABSTRACT

This paper is based on the Survey Studies, research findings and extracts from various reports of Academic and Research Institutes of our country. Extracts from new papers and Annual Reports of OIE, FAO & WHO have also been incorporated. There are losses observed by the author in the last two decades, visiting out breaks, not only in Rawalpindi-Islamabad twin cities poultry farms but also in NWFP/Khyber PK, lower Punjab, Sindh, Balochistan, AJK & Northern Areas. Economic losses in monitory terms have been worked out for a single disease at any farm and in a specific time. This paper is limited to endemic bacterial and viral disease of hatcheries braider as well as layer poultry farms while losses due to these infections in grand parent flock could not be recorded. One outbreak of salmonella infection in a flock of 3000 broiles claimed a least f Rs.15000/- in 2009 while there was a loss of Rs.25000/- in a layer flock of Rs.25000/- where 40-45% birds died in 24-36 hours in 2008-2009. Similar reports of Fowl cholera have a direct loss of 12-14% in 24 hours and with a delayed treatment losses were recorded upto 30% in both broilers and layers Economic losses due to CRD showed 100-150 birds dying in 12-18 hours in a flock of 5000 mature birds. Avian bronchitis due to bacterial infection and colio-bacillosis have shown direct losses of death of 15-16% in a single shed while upto 30% death rate has also been reported within 24 hours. The losses due to viral Disease have been reported and recorded with much greeter percentage in young s broilers with Gumboro Avian Influenza (A.I) and in Layers due to A.I, Lukosis, Egg Drop System (EDS) Infections Layringeo Trachitis (ILT) Infections Bronchitis (IB) and Hydro Pericardium Syndrom (HPS) have been reported and discussed. In the last pages of this write-up there are recommendations to the farmers to the effect that Not vaccinating their poultry birds for few thousands rupees there is always a loss of sweeping deaths in a shed, denting a direct loss of many thousands at various times to the poultry farmers.

Key Words: Bacterial, Viral, Disease, Poultry, Economic Losses, Pakistan.

(A) FOWL TYPHOID? AVIAN SALMONELLOSIS:

This disease is caused by Salmonella galisepticum rum which is communicable to human being. This organism is transmitted through eggs. hence the salmonella organisms have been isolated from one week old chicks as well. Salmonella can affect growing chicks, broilers, the pullets & layers and has also been isolated from parent & G.P. flocks. The main symptoms include infection in the digestive system, while the organisms most affected are: liver, spleen, the proventriculus & gizzard. The morbidity rate goes from 60-70% while the mortality rate is not more than 60%.The Diagnosis includes Haemoagglutination test positive with the salmonella antigen.

The control and eradication comprises immediate treatment of birds with antibiotics of choice. The Chloramphenicol in various trade names is available in the market which can be immediately provided to 100% of birds in farm/shed.

Economic Losses:

In a shed of 3000 broilers, the morbidity has been recorded to 1800-2000 birds while mortality ranges within 24 hours to 1000-1200 in growing chicks as well as broilers in the first and second weeks. This, today i.e. 2011, worked out in monitory terms go to Rs.22000/- to Rs.25000/- per 3000 flock, kept at a single farm. Similar financial losses have been recorded within 24-36 hours in layers. In a shed of 5000 layers with a morbidity rate of *50-60%,* the loss was calculated in 3 farms in 2008-09 to Rs.20,000/- to Rs.25,000/-. This loss could have been saved if the haemoagglutination test carried out which is performed in every Quarter of a year and culling/slaughtering the positive ones, as detailed in various text books.

(B) FOWL CHOLERA/PASTEURELLOSIS:

One of the bacterial diseases causing significant losses to poultry farmers is Avian Pasteurellosis. The causal organism is P. avisoptica & is greatly confused with bacterial diseases of poultry causing symptoms of pneumonia in growing chicks and mature birds. Sometimes Avian Pasteurellosis is also not differentially diagnosed with Micoplasmosis.

The diagnostic approach is always fruit-full when the bacterial isolation is made in the laboratory and leads to the correct conclusion from liver, spleen & heart.

The control and eradication measures include the postmortem examination of the dead birds of the first swear attack within 12-24 hours. The morbidity rate is not to high which is starting from 10-20% and increases with the passage of every single day. The mortality rate on the other hand is rather high more than 30% if the treatment is delayed or BOTH the poultry ATIENDANT and the OWNER/FARMER keep sleeping, the number of dead birds increases with the passage of every hour.

Economic Losses:

Losses due to Pasteurellosis in a broiler shed of 3000 have been recorded in terms of number of dead birds to 200-400 while in swear cases 700-800 dead birds have been recorded at a single farm which in monitory terms a loss of Rs.5000 to Rs.8000 in two different farms observed & recorded in 2007-08. Similar cases have been reported from many farms of each province of the country.

(C) INFECTIOUS CORYZA:

This is a disease caused by Haemophilus gallinarum, a notorious strain causing infection in poultry birds while the other similar strain namely H. paragallinarum causes infections in turkeys. The main symptoms include bronchitis, pneumonitis whistling rales and bronchial sounds, supported with nasal discharges. The birds become weaker with low appetite, low .intake of feed, no weight gain. The morbidity and mortality rates are low. Still the death

rates are in hundreds in a shed of 5000-6000 birds. The quick diagnostic approach and treatment with antibiotic of choice will lead to earlier stoppage of the spread of the disease, while the delay in treatment may sweep the flock.

(D) CHRONIC RESPIRATORY DISEASE (CRD):

This bacterial disease is caused by Micoplasma gellisepticum. The symptoms resemble to avian Pasteurellosis and infectious pneumonia when differential diagnoses is studied. The exact diagnosis reveals the causal organism in the laboratory. When the post mortem is conducted out of a few dead birds immediate antibiotic therapy must be carried out with the drug of choice recommended by the laboratory personnel & veterinary doctor concerned.

Economic Losses:

The economic losses have been reported from less than 50 birds per three thousand broilers or 50-100 birds dying due to CRD in layers within first 6 hours, of the, onset of the disease. When both the POULTRY ATTENDANT and FARMERJOWNER are sleeping, the CRD spreads like fire. Within 12-24 hours, if no antibiotic treatment is carried out, a mortality rate of upto 70% has been recorded in various farms both in broilers and layers with a loss of many thousand rupees.

(E) AVIAN BRONCHITIS:

As the name indicates, the disease is characterized by coughing, nasal discharges and expiratory exudates. The disease has been reported in growing chicks from few weeks to the stage of laying. The death rate is not too high but avian bronchitis from bacterial origin has also caused tremendous losses to the farmers. It has been observed in the last two decades that in one shed of 3000 birds, four to five birds have been found dead, in first 4-6 hours which doubled in 8-12 hours and so on.

Immediate diagnosis must be carried out in the nearest available laboratory and the antibiotic therapy must be undertaken with the drug of choice.

(F) COLIO BACILLOSIS (E. COLI INFECTION):

This is one of the most common diseases of poultry. E.coli is transmitted through water, feed and with mechanical sources. The symptoms include inflammation of intestines, diarrhea and/or dysentery leading to death of the birds. E.coli infections have been recorded in baby chicks of 1-2 weeks, maturing birds of 5-6 weeks and at any stage in layer birds. The morbidity rate is less than 20% while the mortality rate within 24 hours may reach upto 30%.

The postmortem examination of dead birds along with the isolation of the organism from the morbid material leads to the exact diagnosis of the disease. Control and eradication measures include decontaminating the drinking water

with Chlorination or Potassium per magnate and/or a safe decontaminant. E.coli infection causes considerable losses in growing chicks where the morbidity and mortality rate sometimes reach 40-50%. Lot of data is available on E-coli infection and Chemo-therapeutic trials of various antibiotics of choice. Such-findings have been documented in various reports and publications in local and foreign journals and in most of the Annual Reports of PRIs (2006-07) and VRIs Peshawar (2005-06), (2006-07) and (2007-08).

THE ENDEMIC VIRAL DISEASES (RNA VIRUSES)

(G) NEW CASTLE DISEASE: (NCD)

The disease is also known as Rani Khait and has been recorded in baby chicks of first week, if not vaccinated this may spread in 2nd week and if not vaccinated, in the 14th week. The disease may spread in whole the flock. NCD when flairs up, the morbidity rate goes to 80% and in the wake of no vaccination the mortality rate goes to 100%, causing sweeping deaths.

The symptoms include off feed/In-appetence & low weight gain. The birds are dull and depressed with roughened feathers. Two main categories of clinical signs have been recorded at many farms namely (i) The Viscero tropic symptoms and (ii) The neurotropic symptoms. In the first category the digestive system including. intestines, liver, spleen and proventriculus is involved. There are droppings from the beak and lacrimations. The petichial haemorrhages in the proventriculus are the differential diagnostic tool in the P.M. examination, as compared to other similar viral diseases. The neurotropic NCD affected birds show symptoms of circling movements, bending of neck to one or both sides and touching the ground with beak quite often with or without lameness.

Control and Eradication:

The routine vaccination at day seven/first week of chicks, 2"' vaccination within 2"' and 3 week or maximum at day 21st and 3rd vaccination fourth week i.e. day 28 of the growing poultry birds is recommended. This vaccine today costs Rs.7000/- to 7500/- for 3000-4000 birds. The vaccine produced-from any two of the strains namely ND-Lasota and/or Hitchner strain is available in the market in various trade names.

Economic Losses:

It has been observed that if first vaccination is skipped with negligence, carelessness or with error ND may not spread if there is parental immunity existing in the chicks. The disease has been recorded in many hundred chicks out of 3000-4000 birds in a flock. The 2nd vaccination if avoided again by negligence, carelessness this is the time when ND may spread like any thing and 80-90% sweeping deaths has been recorded. The losses estimated in a flock of 3000-4000 broilers when no vaccination was done in the year 2008 was Rs.20000/- to Rs.25,000/- per flock and sometimes more.

The diseased birds also do not fetch good price if slaughtered which again a recurrent loss to the poultry farmers. 100% death has also been recorded in the non-vaccinated rural as well as commercial poultry birds at many places in the country documented in various journals published in the country and various Annual Reports of VRIs of Lahore, Peshawar, Quetta, Karachi and Rawalpindi.

(H) INFECTIOUS BROCHITUS (IB)

This disease has been seen in various poultry farms mostly the growing chicks are affected while the disease has also been recorded in the mature birds as well as layers if not vaccinated in time. The clinical signs of the infectious bronchitis are sometimes confused with the diseases namely Bacterial Bronchitus, Infectious Coryza and the Chronic Respiratory Disease (CRD).

The diagnosis is confirmed on the postmortem examination of the poultry birds when there is no isolation of bacteria from the tissue samples of liver, lung and spleen. This is also supported by the specific lesions of the Infectious Brochitus specially the lungs of the affected bird sink in water.

Control and Eradication:

The IB Vaccine is available in the market either in single strain preparation or in combination as ND-IB and/or ND-IB-IBD. These vaccines are available -under various trade names and all -the poultry birds must be vaccinated under the Poultry Vaccination Schedule of broilers as well as layer birds including parents and G.P. flocks.

Economic Losses:

If the vaccination schedule is not strictly followed the IB may spread in 20- 30% growing birds. If again the IB vaccination is not done within proper time this may spread to 40-50% of the growing as well as mature birds providing tremendous losses to poultry farmers. In an out break of IB 40-60% deaths were recorded in the non-vaccinated birds in broilers while in a similar report in 2006-07 three farms were visited by the author, with symptoms of IB and losses were recorded upto the tune of *65%* in broilers and layer birds in flocks of 6000 and 8000 birds in separate sheds. This is a single example of IB where a farmer had to face a net loss of Rs.30000/- to Rs.40000/-. Had he spent Rs.8000/. to 8500/- on the vaccination of IB either single strain vaccine or combination strain vaccine, this loss could have been avoided.There are many such examples from where IB was reported from various provinces and such losses were discussed in various meetings, symposia, conferences and seminars in the country, documented and Published reports are available.

(I) AVIAN INFLUENZA (AI) BIRD FLU:

This disease is caused by Orthomyxo Viruses family, Genus Influenza virus. An RNA virus causing huge losses not only in Pakistan but in the

neighboring countries, regional countries and has been declared as a Trans Boundary Poultry Disease. The disease has also been recorded in Asia, The Europe, The Canada and other continents as well. The symptoms include nasal discharges, symptoms of flu and sudden death, leading to 80-90% birds dead within 24-36 hours. A devastating condition of Avian Influenza was recorded in 1994 in which layer birds died totaling to 44000 in Rawalpindi-Islamabad twin cities in 22-24 farms, from Tarnol to Treth areas. Another out break was recorded in 1995 where compensation was provided on emergency basis to the poultry farmers. Sporadic outbreaks were recorded at many places in the year 2000 and 2003.

Keeping in view the Exegencies the Government of Pakistan, Ministry of Livestock and Dairy Development (MLDD) -launched a mega development project entitled, "National Program for the Control and Prevention of Avian Influenza" and was implemented in 2007 for a period of 3 years with a total cost of the project as Rs.1180.142 millions. The objectives comprising to improve and scale up Avian Influenza surveillance, reporting and diagnosis in 80-90 districts of the country. The main purpose of this project was also to strengthen disease control, outbreak containment and eradication of the highly pathogenic strain of Avian Influenza (Burial of dead birds in 5-6 feet deep ditches, sprinkled with lime). The-project also included compensation to the farmers showing dead birds in their farms, verified by the project technical teams. The project also aims at improving the Avian Influenza vaccine evaluation and quality assurance system along with developing legal and regulatory framework for providing veterinary services to the end users i.e. the poultry farmer.

Economic Losses:

When the disease flairs up there is sweeping deaths in the poultry sheds and losses upto 95% dead birds out of 5000-6000 broilers has been recorded from a single farm to a tune of Rs.40.000/- to *Rs.50,000/-*. Many such examples exist which have been recorded and the Ministry of LDD, GOP, Islamabad have provided millions of rupees as compensation to provide a sigh of relief to the farmers. The Annual Report of 2007-08 of this project is available with the project Director, NPCPAI, NARC, Islamabad.

(J) INFECTIONS BURSAL DISEASE (IBD)

This disease is also known as Gumboro Disease and is endemic in our poultry farms. It has been recorded in most of the farms in various districts of the country. The causal organism is an unclassified virus. Since the viral diseases do not respond to any kind of antibiotic treatment hence the Prophylactive Vaccination is the only way out towards protection of poultry birds against this disease.

Diagnosis:

Since clinical symptoms are recorded with less intensity but death within three to four days, specially after day sixteen to twenty of the growing poultry birds. The Exact day and time of vaccination has been recommended in

various books in the third week of broilers as well as layer birds preferably day 16-20 which is prescribed in the poultry vaccination schedule (in vogue in various poultry farms of the country). The post mortem examination of dead birds indicates the Bursa off abricia as inflamed, supported with other symptoms of the disease in internal organs. The death rate has mostly been recorded from 65-75%, in a single shed within 24-36 hours.

Control and Eradication:

IBD vaccine is available in the country under various trade names and by various companies, either in single strain preparation or in combination with other vaccines in the form of ND-IBD, IB-IBD, ND-IB-IBD and/or EDS-IB-IBD. Two main strains are used in the IBD vaccine preparation namely inactivated Gumboro Virus Strain and Live intermediate Gumboro Disease Virus Strain Winterfield 2512 or Gumboro vaccine Nobilis-D-78 Strain with or without vitamins & -minerals supplementation.

Economic Losses

Gumboro Disease/infectious Bursal Disease has provided losses of 70-75% dead birds in the broilers, of 4000-5000 birds, per shed, when there was no vaccination done against IBD. The total loss faced by the farmer in this example was Rs.28000/- to Rs.30000/- per flock in one village. Many such examples exist in various towns tehsils and districts of the country. The data of IBD outbreaks is available in various annual reports of VRIs Peshawar, Lahore, Quetta, Karachi and PRI Rawalpindi, reports in 80s, 90s and even in recent reports of 2006, 2-007 and-2008 as recorded.

(K) AVIAN LUKOSIS (BIG LIVER DISEASE)

This disease is caused by retro-viruses, genus Onco virus, characterized by sudden death with a peculiar lesion of liver which becomes three to four times of the normal liver of a poultry bird. Lukosis is the disease of mature birds and is mostly found in layer poultry birds, very rare cases occur in Broilers.

As this has very rarely been found broiler chicks hence the. differential diagnosis should divert the attention of the diagnosticians not misleading with Mareks disease which is always prevalent in the growing baby chicks. The morbidity rate is always low i.e. upto 20-25% but mortality rate goes upto 90% when the disease actually takes its toll.

Economic losses

Lukosis disease causes huge losses in the layers, parent flocks and G.P. Flocks. A severe attack in 2005 in a layer farm gave a total loss of Rs.70,000/- to Rs.80,000/- in a flock of 6000 layers. Immediate control and eradication measures not adopted, the losses could have been even more.

Control and Eradication

Since a specific viral disease control is not yet developed, the safety and precautionary measures need to be adapted in providing neat and clean drinking water; segregation of diseased birds and containing the disease this

will reduce the spread of the disease at a single farm/shed. It is also recommended that both the poultry attendant and the farm OWNER should quickly remove the infected birds and adopt the strict hygienic measures, under the Poultry Health and Hygiene Schedule, available in the annexures of this chapter at the end.

Marek's Disease

This is a disease of young growing baby chicks in which the characteristic symptoms include sudden death of the chicks within 24-36 hours. Lot of work has been done at the post graduate level in various universities specially the faculties of Veterinary Sciences and various VRIs of the country for vaccine trials etc, in the disease.

Diagnosis

The P.M. examination reveals that their was no bacterial isolation from the affected organs liver, spleen, intestine or lungs.

Control and Eradication

Prophylective vaccine prepared from live Herpes Turkey Virus of Marek's disease strain FC-126 (serotype 3) is available in the market in the trade names of Marek HVT-Frozen, Marek MD (Rispens) and Marek Bivalent (HVT + Rispens). This vaccine is injected in the muscles or subcutaneous wing skin with a does of 0.2 ML to 100% of the chicks is recommended preferably in a first week of age both the broilers and layers.

Economic Losses

Within the first week of the age of broilers or layers, Marek's disease sometimes claims 60-70% morbidity while the mortality rate may go upto 95-100% when no vaccination has been done in the newly arrived batch, at a farm. In the year 2006 when the rate of day old chick was Rs.35/- to Rs.40/- each, a loss of Rs.28000/- to Rs.30000/- in a flock of 5000 birds was recorded. Had he vaccinated the birds with Marek's disease vaccine, in the first week of the baby chicks, with a total cost of Rs.6000/- the losses would have been avoided.

Similar cases have been reported in the year 2007 and 2008 in various districts of NWFP and Sindh provinces where the disease was recorded in the non vaccinated baby chicks. It is recommended that the farmers must vaccinate their chicks in the first week of age, with a vaccine from the market especially from those companies who import this vaccine from their international principals with the particular strains mentioned above so that they do not face the economic losses.

(M) AVIAN ENCEPHALOMYELITIS

Avian Encephalomyelitis is a disease caused by an RNA virus, the Picoma viruses family, genus Entrovirus. The clinical symptoms include

lameness in the thighs, joints, and tibia! bones. The joints become swollen and the bird is unable to move or walk and most of the times sitting in the shed. It is a disease of mature birds and layers. The morbidity rate is higher 70-80% while the mortality rate is very low, upto 20-30%.

The disease can be diagnosed clinically on the clear cut symptoms narrated above while the post mortem examination of the dead birds indicate the inflammation of thigh bones, muscles, joints and the related material. In this area the farmers have a tradition of slaughtering such birds immediately and the disease never spread like an outbreak as observed and reported in other viral diseases.

Control and Eradication:

Prophylactive vaccination with live attenuated Avian Encephalomyelitis virus, strain Calnek 1143 is recommended to be carried out between the 10th and 15th week of age. It is also recommended that pullets before sale in any of the Rural Poultry Development Program, these must be. 100% vaccinated with this vaccine with a minimum cost of Rs.8000/- to Rs.8500/- for a flock of 3000-4000 birds.

Economic Losses

In the non vaccinated birds there had been financial losses upto Rs.10000/- to Rs.15000/- per 50% of the flock of 3000-4000 birds, before reaching the age of laying eggs.

(N) VIRAL ARTHRITIS/TINOSYNOVITIS

(Reo Virus Infections) This disease is caused by Reo viruses characterized by swelling of joints and the heads of the long bones in pelvic as well as hock joints. The main symptoms, as seen in the sheds, include the birds unable to move, keep sitting or moving with difficulty and most of the times sitting with bent legs on the floor or cage. The animal is very slow in taking feed but remains active. If control and eradication measures are not taken the birds become weaker with the passage of time, this may cause the death of the bird. The morbidity rate is again high in mature birds with low intensity of mortality. This disease is seldom noticed in broiler chicks. This is a disease of layers, parent flocks and G.P. flocks. Egg production is also reduced.

The clinical signs indicate the prevalence of the disease while the P.M. examination confirms the disease with the lesions stated above. More so, the disease never responds to any antibiotic therapy. The number of diseased birds increases with tine.

This disease needs vaccination once a year. The vaccine available in the market is prepared from Inactivated Arthritis Virus (Reo Virus) Strain S1133 under various brand name preparations which can be obtained and the flocks must be vaccinated in time.

Economic Losses

Poultry farmers seldom face huge losses but when the virus gets introduced in a farm it is then very difficult to get rid of it. Losses in terms of morbidity indicate that the diseased birds become unproductive. An example existed in a farm in district Chakwal in 2006 where the layer farm experienced Arthritis and Tenosynovitis.

Immediate control and eradication measures adapted even then 100-120 birds were rendered as non productive and were culled/slaughtered. This was a recurring loss to the farmer in the initial stages of production of eggs in a flock of 4500 layer birds. Many such examples exist in the other districts of the country as reported in the journals and Annual Reports of VRIs in the year 2005, 2006, 2007 & 2008.

(O) MALABSORPTION SYNDROME

In this disease two kind of syndromes converge in a multi facet clinical signs in layer birds specially in pullets before laying. This disease has not been reported in broiler chicks as the clinical signs and P.M. examination reveals the disease being prevalent in the 10th to 15th week of age. It is recommended that in all Rural Poultry Development Program of distribution of 25 poultry birds (22 pullets and 3 cockerels) must be 100% vaccinated against this viral disease.

Control and Eradication measures include the strict hygienic measures in the wake of disease outbreak and Prophylactive vaccinations against this syndrome with inactivated Reo Virus strain Si-133 under any of the trade names. These vaccines are available in the market and the birds must be vaccinated to avoid economic losses.

Economic Losses

In this disease the morbidity rate is again towards higher rate which can go upto 40% while the mortality rate may be low as 10-15%. The morbidity also leads to low productivity and a recurring loss of no egg production to the farmer. The diseased bird also needs to be culled and slaughtered, other wise these become the potential source of spread of disease, at any farm.

(P) IUFECTIONS-LARYNGEO-TRACHITIS (ILT)

This disease is caused by a DNA virus included in the group of Herpes viruses' genus ILT virus, characterized by the clinical symptoms of infection of larynx, the trachea and the bronchi of growing poultry birds. This disease has been observed in broilers with low intensity while in the layer flocks, especially in pullets with greater intensity.

This disease must not be confused with bacterial bronchitis in which there is a quick and positive response of the antibiotic therapy. This must also not be confused with Chronic Respiratory Disease (CRD) in which whistling sounds are heard from a far distance and CRD spreads slowly as compared to ILT. There is a quick response of Gentamysine, the drug of choice in CRD and mostly the CRD flairs up in third & fourth week while ILT starts its initial

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indications from fifth week onwards. The symptoms are clear cut and death rate increases with the passage of every hour. From the Post Mortem examination there is no isolation of bacteria from the internal organs namely lungs, liver, spleen and intestines including bursa.

Control and Eradication

The diseased birds must be separated quickly preferably transferred to another shed. Strict hygienic measures be adapted, with or without change of litter. There should be no introduction of new birds at this stage but subject to vaccination with ILT vaccine. It is recommended that both broilers and layers must be 100% vaccinated with live attenuated ILT virus strain PV/64 which is available in the market under various trade names. The best time of vaccination is when the birds are at least four weeks of age. A booster dose is also recommended between the 15th and 20th week of age in layers. The parent and G.P. flocks must be vaccinated every year.

Economic Losses

ILT has provided significant economic losses in many districts of Punjab, upper and lower parts of Sindh, 3-4 districts involved in intensive poultry fanning in Khyber P.K and 2-3 districts in Balochistan while AJK and Northern areas are no exceptions. Financial losses of a few hundred birds in a flock of 3000-4000 layers have been reported dead due to ILT in most of the poultry farming areas of the country and have been documented in various reports of VRIs for the last five to six years. Some reports claim 10-12% mortality.

(Q) HYDRO-PERICARDIUM SYNDROME (HPS) (ADENO-ASSOCIATED-VIRUSES)

This syndrome ;first appeared in the commercial poultry especially-in. broilers. in the year 1987-88 with symptoms of in-appetance, low intake of feed and low weight gain with the duration of the disease as four to five days (incubation period) followed by sudden death of the birds. It has been observed and experienced that the mortality rate was higher upto 60% in some of the broilers and layer flocks.

The virus involved in this disease was diagnosed locally as Adeno-virus but was confirmed as Adeno-associated virus by the international laboratories namely NADC, Ames, IOWA, USA and the Central Veterinary Laboratory Weybridge, Surrey, UK along with the Central Veterinary Laboratory Rotterdam, Netherlands. This laboratory has now been shifted to Lileystad, Netherlands.:

Control and Eradication

Auto vaccination started developing in various institutions namely PRI Shamsabad, Rawalpindi and VRI Lahore, in millions of doses. The farmers were satisfied with this vaccine for few years. Lat on a purified strain vaccine

has now been developed and is available in these institutions on cost basis for the farmers.

Economic Losses:

In the earlier stages of the first eruption of this disease in 1987-88 more than twenty thousand birds died in the Rawalpindi-Islamabad-twin city's poultry farms. Sporadic cases pop-up in many parts of the country every year in unvaccinated poultry birds. Since the farmers are now used to the routine vaccination, every year, the huge losses have been reduced to a considerable extent. In the recent past, in 06-07 the mortality rate has been documented as not more than 10-15% in broilers as well as layers in various parts of the country.

(R) QUAIL BROCHITIS (CELO VIRUS INFECTION)

This disease is experienced in Pakistan in four to five places where quail farming is done on commercial scale. It has been recorded and reported cases of quail bronchitis from Mansehra, Rawalpindi-Islamabad twin cities, Kamalia, Arifwala and Karachi. Clinical symptoms include the signs of bronchitis closely resembling to CRD. The disease is equally prevalent in young and mature quails with sneezing, nasal discharges and lacrimation. The unvaccinated birds also show a low death rate of 10-15% out of the morbid quails in incubation period) followed by death rate of 20-30%, within a weeks time, at a single premises/farm/shed.

Control and Eradication Measures

Strict hygienic measures are always recommended with change of litter. No new birds should be entered in this flock subject to vaccination with quail bronchitis virus vaccine.

Economic Losses:

Losses in the quail farms have been recorded in the year 2004-05 and 2006 to the tune of 10-15% death rate in a flock of 1000-2000. The rate of one quail before slaughter weighing upto *250* grams with a cost of Rs.12/- to *Rs.15/-* in 2004-05 while today in 2012 this rate has gone upto Rs.50/- to Rs.55/-.

(S) FOWL POX/AVI-POX VIRUS INFECTION

This disease is caused by the DNA virus family Avi Pox virus, genus fowl pox virus. The disease is characterized by Pox lesions on the comb, wattles and under the wings and thighs including eye-lids and nasal openings. The morbidity rate is high in one place/shedlfarm while death rate is very low, upto 15-20%. The additional clinical signs include the birds being list-less, roughened feathers, comb and wattles cyanosed and the birds become sluggish with low intake of feed and low weight gain rather weight loss with high rise of temperature, decreased egg production has always been noted.

The pox lesions are always specific. Tissue material from pox pustules are sent to the laboratory, for diagnosis and confirmation of pox virus, in glycerin saline solution.

Control and Eradication Measures

Strict hygienic measures are adapted with change of litter. Since there is very low percentage of deaths, the dead birds are culled, not slaughtered but burned deep into the soil with lime. Antibiotics to check the secondary infections are also helpful. Pox is observed in broilers to a very rare intensity while in layers it has been recorded with a greater intensity. There is sudden decrease of egg production while the diseased birds become potential danger to the rest of the flock in a shed.

Economic losses in terms of financial burden to the tune of 10-15% loss of egg production and total loss of diseased birds goes to Rs.8,000/- to Rs.10,000/- in a flock of 4000 birds, if the disease is quickly diagnosed and containment action taken. Such losses can be avoided with the fowl pox vaccine of not more than Rs.8000/- for a flock of 6000 birds.

Economic Losses

The live attenuated Fowl-Pox virus vaccine, strain Brescia P-1 and other vaccines of fowl-pox virus are available in the market under various trade names. The breeders must be vaccinated in the age of 10-15 weeks while younger chicks 1-5 weeks of age and repeated after 80 days. In layers the vaccination is done before one month of the age of laying. Poultry Health Care Schedule must be implemented in the 100% of birds kept at a farm/seed/ premises.

(T) EGG DROP SYNDROME (EDS)

It is a virus disease affecting the layer birds resulting in loss of in the production of eggs. This disease has not been recorded in broilers. This disease is also prevalent in parent flocks and G.P. flocks.

Clinical Diagnosis includes low production of eggs, eggs without shell and/or loss of eggs. Other clinical signs include the birds with inappetance, low intake of feed, low weight gain and sometimes loss of weight results in occurring of the disease. If precautionary measures not adopted, the disease spreads quickly.

Control and Eradication Measures

In addition to strict hygienic measures and removal of diseased birds (culling and slaughtering), no introduction of new birds should be done but subject to vaccination. The vaccine available in the market is prepared from inactivated EDS 76 virus. The birds must be vaccinated at the age of 18-20 weeks just before the laying period. EDS vaccine is available not only as single strain vaccine but in a combination of two ND-EDS or three vaccines ND-EDS-IBD and four vaccines ND-EDS-IB-IBD and ND-EDS-IB-REO combinations.

Economic Losses

This disease is endemic in many laying farms of the country. Four international companies namely IZO Veterinary Vaccines-Italy, CEVA Veterinary Vaccines-France and TAD Veterinary Vaccines. The Netherlands are continuous suppliers of various bacterial and viral vaccines in Pakistan.

Millions of doses of various bacterial and viral vaccines are sold every year to the local poultry farmers including EDS virus vaccine which indicates that EDS is prevalent in our country.

MESSAGE TO THE POULTRY FARMERS

There is a clear cut message to the farmers, the farm Manager, the students, the teachers and traders that: -

a) Complete balanced diet should be provided to poultry birds with special reference to vitamins and minerals.
b) Good Management Practices (GMPs) be observed in each broiler and layer farm including parent and GP flocks.
c) Farmers, Poultry attendants and manager should remain vigilant in observing any abnormal condition at the farm.

Animal Health Care Schedule must be implemented in each shed, at each farm and each farm premises.

Are you a poultry farmer? If yes, attention please.

a) Have your newly introduced chicks to farm vaccinated 100% against NCD in First week.
b) Get your growing baby chicks (100% vaccinated with first booster dose of NCD in Second Week.
c) Get your Broilers and Pullets vaccinated 100% against IBD/Gumboro disease in 3rd week.
d) Get the grown chicks/poultry birds vaccinated 100% protective dose against ND in the farm.
e) Get you pullets vaccinated (100%) against FDS and ILT (12-15 weeks).
f) Change the feed/Ration Number every week.
g) Get your chicks tested against Coccidiosis & other Helminthic Infestation (Random). And treated accordingly.
h) Get your layers tested against Nematodes (round worms) and Cestodes (tape worms)
i) Make sure there are not ticks in your farm, if there is any such indication. You are creating problem for your self. Take immediate action for control and eradication.

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INCREASING TREND OF ENROLMENT OF MATRIC AND F.A STUDENTS IN AGRICULTURE AND LIVESTOCK AT AIOU AS OBSERVED THROUGH PAPER EVALUATION OF FOUR SEMESTERS

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ABSTRACT

An investigative approach was made in the paper evaluation of Agricultures and Livestock Course Codess 211 and 219 (Matric) while 313, 326, 327 328, 329, 342 and 349 (FA) of Allama Iqbal Open University (AIOU) for Four Semesters, namely Spring 2010 (Group 1310), Autumn 2010 (Group1240), Spring 2011 (Group 1415) and Autumn 2011 (Group 1561) respectively. This paper describes the total answer Scripts (Papers) evaluated each Semester, Number of Sub: Examiners (SEs) assisting the Head Examiner (HE) supported by one Assistant to HE, their attendance in days, total number of bundles in each Code, (self marking inclusive) and followed by the remunerations of HE, both male and lady SEs as well as Assistant (in each group) alongwith tax paid @ Rs.6% of their claims. An increasing trend was observed in the total papers evaluated when compared with 6182 Spring 2010 semester an increase in papers was observed 9626 (55.71%), 10662 (71.66%) and 11300 (81.75%) for Autumn 2010, Spring 2011 and Autumn 2011 respectively. The remunerations (taken from bills) of each Semester (referred), indicated that the HE claimed Rs.3290/-, Rs.2283/-, Rs.20162/- (self marking inclusive) and Rs.21510/- for all the Four Semesters and paid 06% tax, amounting to Rs.3019/-. The six SEs claimed collectively Rs.49994/-, Seven SEs Rs.73047/-, twelve SEs Rs.91514/- and 17 SEs as Rs.92702/- for Spring 2010, Autumn 2010, Spring 2011 and Autumn 2011 respectively. The SEs paid 6% taxes collectively for Four Semesters worth Rs.2558/-, Rs.4661/-, Rs.6053/- and Rs.5917/- respectively. One Assistant to HE claimed Rs.2467/-, Rs.9048/-, Rs.10,022/-, and Rs.10622/- and paid a collective Tax @ 06% amounting to Rs.2052/- for all the Four Semesters. The Code-wise quantum of bundles alongwith the male SEs and lady SEs response on various days of paper evaluation has been described. Our observation supports the increasing trend of enrolment of students at Matric and FA level in Agriculture and Livestock Courses in the AIOU. Distant Learning System shows the interest developing, as seen in various codes in Four Semesters analyzed in this paper. The paper concludes with recommendations for further improvement.

Key Words: AIOU Paper Evaluation Agriculture and Livestock Courses Enrolment Pakistan.

INTRODUCTION

Allama Iqbal Open University (AIOU) is offering Agriculture and Livestock Courses at Matric and FA levels since 1986 when only two courses were offered. In 1998-99 more courses were offered namely 211 (Poultry Sciences) and 219 (Agriculture Sciences) at Secondary School Certificate (SSC)/Matric level and Codes 313 (Dairy Farming), 326 (Zarai Umoor) 327(Farm Machinery and equipment), 328 (Oil Seed Crops), 329 (Agriculture farming) 342 (Horticulture) and 349 (Plant Protection). These courses are still being enrolled by the students with

an increasing trend, as observed by the Paper evaluation Panel since 2009-10 Hafeez *at.el* (2009-2010). The Principal Author remained involved as Sub: Examiner (SE) under the supervision of Prof. Fazal Karim, Ex-Dean of Faculty of Agriculture, Sindh Agriculture University, Tando Jam (SAUT) as Head Examiner (HE) alongwith all other Sub-Examiners (SEs) supported by one Assistant to HE, since the year 2000.

As a routine a panel of Examiners (including HE, SEs and one Assistant) is proposed each Semester. Proper qualifications (at least MSc (Hons)/M.Phil in the relevant subject) and experience alongwith all pre-requisites are completed and got approved by the Chairman of the Department concerned supporting by the vetting of Dean of the Faculty of AIOU. This panel starts evaluating papers (Answer Scripts) in the Secrecy Section of AIOU with complete insurance and observance of Secrecy, as per instructions of AIOU (Anonymous – (2002), (2007) and (2009). With the passage of time, the total time period (Duration) involved in paper evaluation each Semester, was increasing steadily. For example when the SEs were more than 10, the evaluation work (quantum) lasted for 25-26 days, but this duration in (days) was being continuously observed as increasing each new Semester.

An investigative approach was desirous of this group. The Panel of Agriculture and Livestock) to assess the increasing trend of enrolment in the individual course(s), comparing the work of three Semesters Autumn 2010, Spring 2011 and Autumn 2011, with that of Spring Semester 2010.

It is with this background, that the Committee of Courses (COC) and the Faculty Board (FB) members have supported the introduction of such courses e.g. in 2011-2012, two new courses namely 253 and 254, Basic Livestock Production at Matric level have been developed and are in the final stage of printing. When these Books are ready, these will be included in the Prospectus of 2012-13 and onward Insha Allah.

This paper describes the total quantum of work (number of Answer Scripts per bundle, the response of SEs each Semester, for all the Four Semesters (under investigation) and remunerations of HE, the SEs in a Semester and the only Assistant involved throughout the evaluation period, including the remuneration claims. The remuneration have been claimed in accordance with the notifications issued AIOU authorities from time to time. Anonymous (2007) and (2009). Each Semester there had been a peaceful and cordial atmosphere of work, in the Secrecy Section of AIOU, Islamabad and the targets were always achieved within dead lines.

MATERIAL AND METHODS

(i) All the SEs, being Masters Degree holders, under the supervision of HE supported by the Assistant, as detailed in each Semesters evaluation panel.

(ii) The "keys" were prepared mostly by the HE and were readily available at the time of evaluation for each Code.

(iii) One bundle of any code was randomly provided by the Secrecy Section, on daily basis. The second one was only issued when the first one was completed.

(iv) Equal distribution of answer scripts, out of a single bundle (of any code) was exercised as per instructions issued by the Controller of Examinations AIOU (2007) 2008) (2009) and (2010).

(v) All entries were made in the Secrecy Register, the script confirmation Proformas and Daily Script Distribution Proformas, on regular basis.

(vi) The Award Lists were prepared mostly by the Assistant but most of the times, the SEs and HE assisted in compilation, double checking, counting and signing each Award List, positively.

(vii) Remuneration bills were prepared in accordance with the work done (Recorded on each completion of Days work, vide Notification issued from time to time by the Controller of Examinations (2008) and (2011).

(viii) Bills with Gross claims as per AIOU rules were subjected to 6% tax deduction and Net claim of each HE, SEs, Assistant including self marking, was submitted to Accounts Section of Secrecy. An amount of Rs.9/- for Matric and Rs.10/- for FA papers were claimed. The proper Record was maintained with the Principal Author, as a routine, for each Semester.

(ix) The data, thus obtained, was subjected to proper statistical analysis and has been presented in the tabulated form in the results.

RESULTS

The paper evaluation work of Semester Spring 2010 carried out by this Group (ID No.1310), comprising one H/E, Six (06) SEs, two male and four Ladses supported by one Assistant at one time, examined 6182 papers, comprising 20 bundles, along-with self marking of 06 bundles, by the Author, Dr. M. Hafeez, indicated that the HE claimed Rs.3210/- Six SEs collectively claimed Rs.40,094/- and the two Assistants (one at a time) claimed Rs.2447/- with Tax deduction of 6% as Rs.210 by HE Rs.2558/- by Six SEs and Assistant as Rs.156/- amounting to Rs.2924/- as tax respectively as shown in Table No.1, below.

The paper evaluation work of Autumn Semester 2010 (with Group I.D. No.1240) comprising one H/E, six SEs (05 male and one lady examiner) and an Assistant evaluated 9626 papers of codes i.e. 211,219,313,326,327,328,329, 342 and 349 respectively. The total quantum of papers were increased by 3444, (55.71%) over the Spring Semester 2010. All the examiners namely H/E Six SEs and one Assistant claimed Rs.2283/-, Rs.73047/- and Rs.9048/- deducting 6% tax collectively amounting to as Rs.5385/- as shown in table No.2 below:-

Table 1 Showing the No. of answer scripts evaluated n four semester with their remuneration (s) at AIOU headquarter, Islamabad Spring – 2010

Sr. #	Examiner(s)	Rs. Gross claim	Tax 6%. Rs.	Rs. Net Claim
01	Prof. Fazal Karim, H/E PAPERS (20)B SEs	3500/-	210/-	3290/-
02	Dr. Muhammad Hafeez	29,727/-	1783/-	27,944/-
03	Dr. Atyia Azim	4,667/-	280/-	4,337/-
04	Dr. Tabinda Khawaja	1,050/	63/-	987/-
05	Aniqa	1,355/-	81/-	1,270/-
06	Mr. Bilal Mansoor	3,816/-	229/-	3,587/-
07	Fozia Anjum	2,037/-	122/-	19,151/-
	Sub Total	**42,652/-**	**2,558/-**	**40094/-**
01	Sudher (Assistant)	1,264/-	76/-	1,188/-
02	Zahida (Assistant)	1,339/-	80/-	1,259/-
	Sub Total	**2,603/-**	**156/-**	**1,259/-**
01	Dr. Muhammad Hafeez (Self Marking)	4832/-	290/-	4542/-

Table.2 Showing the number of answer scripts evaluated in four semester by the agriculture and livestock group with their remuneration(s) at AIOU, Headquarter, Islamabad Autumn – 2010 Group - 1240.

Sr. #	Examiner(s)	Rs. Gross claim	Tax 6%. Rs.	Rs. Net Claim
01	HE Prof. Fazal Karim	2429/-	146/-	2283/-
02	SEs Dr. M. Hafeez	24832/-	1481/-	23341/-
03	Fahad Karim	13596/-	814/-	12782/-
04	Bilal M.	2946/-	177/-	2769/-
05	M. Jehangir	6954/-	417/-	6537/-
06	Sumaira Haider	15202/-	911/-	14291/-
07	Tanzeel Javed	11395/-	684/-	10711/-
08	M. Daud-ul-Hasan	2783/-	167/-	2616/-
09	Zahida	9626/-	578/-	9048/-
10	HE – 01	2429/-	146/-	2283/-
11	SEs-07	62506/-	3750/-	58756/-
	Grand Total	**15202/-**	**911/-**	**14291/-**

The work done in Spring 2011 semester by the Paper evaluation team (with Group I.D NO 1415) worked for 35 days regularly and examined a total of 10662 papers of all codes which showed an increase of 4430 papers, over Spring Semester 2010 with an increase of 71.66%. The day wise response/attendance of SEs is also available in table 3. All the three categories of personnel of this group i.e. H/E, the 12 SEs and one Assistant claimed Rs.20162/-, Rs.91514/- and Rs.10,022/- respectively. This team of 14 persons deducted Rs.7980/- as 6% tax on their remuneration bills.

Table-3 Showing number of answer scripts evaluated by agriculture and livestock group with their remuneration at AIOU, headquarter, Islamabad Spring – 2011 G-1415

Days.	Examiner(s)	Rs. Gross claim	Tax 6%. Rs.	Rs. Net Claim
35	Iram, Shahzadi	21700/-	1301/-	20399/-
18	Fahad Karim	13671/-	821/-	12850/-
14	Dr. Jabbar Khattak	6085/-	365/-	5720/-
15	Farzana Khushi	11664/-	699/-	10965/-
16	Nuzhat Shah	12303/-	739/-	11564/-
13	Azizullah Phull	9754/-	785/-	9169/-
07	Imran H. Raja	1640/-	98/-	1542/-
08	Azhar Mehmood	3447/-	207/-	3240/-
05	H.M. Moin	2183/-	131/-	2052/-
08	Bilal Mansoor	1788/-	107/-	1681/-
15	Mohammad Ibrahim	11599/-	696/-	10903/-
07	Ahsan Munir	1733/-	104/-	1629/-
35	Zahida Zahoor, Asstt.	10662/-	640/-	10022/-
	HE	21449/-	1287/-	20162/-
	SEs, F-03	45667/-	2739/-	42928/-
	M-09	51900/-	3314/-	48586/-

Table 4 showing the answer scripts evaluated by the agriculture and livestock group with their remuneration at AIOU, headquarter, Islamabad for Autumn 2011 (G-1561)

Days	Name/Examiner	Gross Rs.	Tax 6% Rs.	Net Rs.
38	Dr. M. Hafeez, H/E	22946/-	1376/-	21570/-
35	Iram Shahzadi	22867/-	1372/-	21495/-
33	Quratul-ain	19466/-	1169/-	18297/-
32	Shabnam Kayani	18488/-	1109/-	17379/-
14	M. Jehangir	6830/-	410/-	6420/-
14	M. Ibrahim	6657/-	399/-	6259/-
10	Safdar Ali	5230/-	314/-	4916/-
03	Fahad Karim	1210/-	73/-	1137/-
06	M. Moinuddin	4040/-	242/-	3798/-
04	Bilal Mansoor	1650/-	99/-	1551/-
04	Nuzhat Shaheen	1449/-	87/-	1362/-
04	Farzana Khushi	1539/-	92/-	1447/-
06	Umer Ameer	2290/-	137/-	2153/-
05	Tajamul Hussain	2070/-	124/-	1946/-
05	Abdul Quddus	1800/-	108/-	1692/-
04	M. Asadullah Asad	1305/-	78/-	1227/-
04	Sehrish Talib	1143/-	69/-	1074/-
04	Waseem Razzaq	585/-	35/-	550/-
	N-05 (12), SE-Females	63809/-	3829/-	59980/-
	N-012 (05) SE-Males	34810/-	2088/-	32722/-
	SEs Total	98,619/-	5917/-	92702/-
38	Zahida Zahoor, Asstt.	11300/-	678/-	10622/-
	Grand Total	**132158/-**	**7928/-**	**124230/-**

The work carried out in the Autumn Semester 2011, of Agriculture and Livestock Group I.D. No. 1561 indicated that the team comprised of one HE, 17 SEs (12 males and 05 lady examiners) supported by one Assistant, as usual, evaluated 11300 papers of all codes 211, 219, (Martic) and 313, 326, 327, 328, 329, 342 and 349 (FA) with an increase of 5052 papers (81.72%) over the Spring 2010, as detailed in table No. 6. The remuneration of Net claim of H/E, 12 male SEs and 05 lady SEs and one Assistant as taken from their bills indicated Rs.21495/-, Rs.59980/-, Rs.32722/- and Rs.10622/- respectively. This team collectively deducted 6% tax amounting to Rs.7928/- as detailed in table 4:

The code-wise No. of bundles and total papers evaluated in Spring 2010, Autumn 2010, Spring 2011 and Autumn Semester 2011 are detailed in table No. 5 below:-

Table 5 showing summarized data of bundles of paper evaluated of various codes at AIOU for semesters Autumn-2010, Spring-2011 and Autumn 2011.

Code	Scripts Evaluated		
	Autumn 2010 G-1240	Spring 2011 G-1415	Autumn 2011 G-1561
211	02(681)	03(606)	03(496)
313	02(254)	02(569)	03(513)
219	08(1942)	08(2100)	09(2148)
326	02(500)	02(465)	02(401)
327	01(181)	02(131)	02(130)
328	04(997)	05(1243)	05(965)
329	03(655)	04(1181)	05(1328)
342	04(1138)	06(1239)	07(1474)
349	11(3218)	12(3250)	13(3416)
Total	**37(10518)**	**48(10784)**	**48(11300)**

It is evident from various code bundles that the enrolment in Autumn 2010, Spring 2011 and Autumn 2011 Codes 313, 219, 328, 329, 342 and 349 has shown increase when compared with the same codes of Spring 2010as presented in Table-6:

Table 6 Showing total summarized number of scripts evaluated in four semester with increase.

Sr. #	Semester	Spring 2010	Autumn 2010	Spring 2011	Autumn 2011
01	Group No.	1310	1240	1415	1561
02	Total Script Evaluated	6182	9626	10662	11300
03	Increase of Scripts	..	3444	4430	5052
04	% increase	..	55.71	71.66	81.72

The attendance percentage also shows a better response P<0.001 of lady SEs over the male SEs when compared and shown in table-7 below:-

Table 7 Showing day-wise working of SEs both men and women for paper evaluation of four semesters AIOU, Islamabad.

Sr. #	Autumn 2010	Group	Total duty days	H/E	SEs Men	SEs Women	Assist:
01	Spring 2010	1310	16	01	02	04	01
02	Autumn 2010	1240	28	01	07	04	01
03	Spring 2011	1415	31	01	09	03	01
04	Autumn 2011	1561	38	01	12	05	01

Table 8 Showing the summarized financial implications of paper evaluation of three semesters (Agriculture and Livestock Group at AIOU, Islamabad SPRING-2010 (GROUP NO. 131)

Sr. #	Spring 2010 G-131	Rs.Gross claim	Tax Rs.6%	Net claim
01	Head Examiner(s)	3500/-	210/-	3290/-
02	Dr. M. Hafeez (SE)	29727/-	1783/-	27944/-
03	Atyia Azeem(SE)	4667/-	280/-	4387/-
04	Tabinda Khawaja(SE)	1050/-	63/-	987/-
05	Aniqa(SE)	1355/-	81/-	1270/-
06	Bilal M(SE)	3816/-	229/-	3587/-
07	Fozia Anjum(SE)	2037/-	122/-	1915/-
08	Sudhe Malik	1264/-	76/-	1188/-
09	Zahida, Assistant	1339/-	80/-	1259/-
	Total	48775/-	2924/-	45831/-

Sr. #	Autumn-2010/G-1240	Rs. Gross Claim	Tax. Rs. 6 %	Net claim
01	Head Examiner(s)	2429/-	146/-	2283/-
02	Sub-Examiner(s)	77708/-	4661/-	73047/-
03	Assistant to HE	9626/-	578/-	9048/-
	Total	89763/-	5385/-	84378/-

Sr. #	SPRING–2011/G-1415	Rs. Gross Claim	Tax. Rs. 6%	Net claim
01	Head Examiner(s)	21449/-	1287/-	20162/-
02	Sub-Examiner (N-12)	97567/-	6053/-	91514/-
03	Assistant to HE	10662/-	640/-	10022/-
	Total	129678/-	7980/-	121678/-

Sr. #	Autumn-2011/G-1561	Rs. Gross Claim	Tax. Rs. 6%	Net claim
01	Head Examiner(s)	22946/-	1376/-	21570/-
02	Sub-Examiner	98619/-	5917/-	92702/-
03	Assistant to HE	11300/-	678/-	10622/-
	Total	**132865/-**	**7971/-**	**124894/-**
	Grand Total	**4,01,001/-**	**24,230/-**	**3,76,831/-**

DISCUSSION

The results of paper evaluation indicate that significant increase (P<0.001) in total papers evaluated in Autumn-2010 semester when compared with Spring-2010. The gross increase was 3444. (55.717) while in Autumn-2010 (9626) over Spring Semester – 2010 (6182). Similar positive increasing position was observed in Spring-2011 as well as Autumn-2011 when the significant increase was 4430 (71.66%) P<0.001%) over Spring-2010 Semester. This definitely indicates the increasing interest of Matric and FA students with considered obtains of the students certainly supported by their insite.

The response of lady SEs was more in attendance/daily for paper evaluation work, as compared to male SEs when seen through daily out put and attendance per semester as detailed in table 4. This may be due to the availability of conveyance or distance from AIOU but the response of SEs and Assistance coming from Rawalpindi had the maximum attendance through the four semester. Observations reservations have been listened form SEs and Assistant for restoration of daily allowance which was permissible earlier.

Paper evaluation at AIOU needs a Strict Monitoring and Invigilation towards Quality Evaluation (SMIQE). This is in vogue in various Boards e.g. FBISE Islamabad Anonimous (2007) and (2010) and Rawalpindi Board of Intermediate and Secondary Education (Anonimous-2007) including cross examination within a single group, as being observed by FBISE Islamabad, Punjab University and others. In the Agriculture and livestock Group, it being observed in each code and every single Bundle in these semesters.

We are also experiencing the cases of Unfair Means (UFM) for evaluation / re-evaluation which need separate attention. these are being dealt with in AIOU rules and Regulations (Registrar AIOU, 2008). It is understood that when experts are involved as Committee Member(s) in various selection of candidates for Admission in M.Sc(Hons) LM, M.Sc(Hons) Agriculture Extension and/or Rural Development in DAS AIOU as well as Selection tests of Lecturers, we scrutinize/short list based on 50% passing marks (M. Hafeez)(2008-2010), the passing marks at FA needs to be enhanced from 40% to 50% w.e.f. 2013-14 to bring quality education.

Similarly there used to be an award of conveyance allowance of Rs.150/- per day to HE and SEs while Rs.125/- per day to Assistants. This needs also be

resumed to financially assist the paper evaluation teams, as the prices of public transport has been increased and the Taxi drivers charge heavily in odd hours, in rains and in days of CNG shut down.

One nominee from each academic Department of AIOU needs to be randomly sitting with paper evaluation groups, for at least 2-3 hours daily, for cross checking the evaluated papers.

There is always room for improvement and if all concerned pay attention to the recommendations, more and more discipline and strictness will prevail and together we can keep the MERIT Flag of AIOU high.

CONCLUSIONS AND RECOMMENDATIONS

1. The paper evaluation team (with various Group I.Ds each Semester) of Agriculture and Livestock courses have always worked in a coordinated atmosphere and with dedication.
2. The HE and the Assistant have shown maximum responsibility of attendance.
3. The lady SEs has shown maximum possible attendance than male SEs in completing the task entrusted to this group.
4. Some SEs, H/E and Assistant have reiterated the resumption of Daily Allowance which was previously permissible.
5. Self marking should be limited to H/E and or the Senior SE (the subject specialist) only.
6. Coordination between Main Secrecy Section (bundle making) and Secrecy (Paper evaluation) can be strengthened with more man power and quick mobility.
7. Payment of Remuneration bills be expedited by appointing 2-3 persons in addition for 1-2 months, post evaluation.
8. One Departmental Representative must be deputed to see the real evaluation, Not only in Agriculture and Livestock Group but other subject Groups as well.
9. As the cost of public transport has been increased. The remuneration bill of Matric Scripts be enhanced from Rs.9/- to Rs.15/- and that of FA from Rs.10/- to Rs.16/- as these rates are back dated.
10. Strict action be taken to Remove Non-subject specialists from various groups to bring quality in paper evaluation.
11. For strictly clearance at Main gates, all Examiners be provided with Examiner Cards. This will facilitate the security people as well as examiners will not need to introduce themselves, every day, at the main gate(s) of AIOU.

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THE RECENT STATUS OF DAIRY GOATS IN PAKISTAN WITH SPECIAL REFERENCE TO POTENTIALS, OPPORTUNITIES AND CHALLENGES FACED BY SCIENTISTS AND FARMERS

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ABSTRACT

Pakistan has 34 goat breeds with a total population of 61.5 million heads which produce 759 thousand tons of milk annually which is about 2.0% of the total milk produced in the country. The famous dairy goat breeds are Beetal, Dera Din Panah (DDP), Nachi, Damani, Kamori and Kacchan, Beetal, DDP and Nachi are breeds of Punjab province; Damani is a breed of Khyber Pukhtunkhwa province (KPK) while Kamori and Kacchan are breeds of Sindh province. The breed-wise population of Beetal is 4.20, DDP 0.16, Nachi 0.12, Kamori 5.29 and Damani 1.31 millions respectively. Most of these dairy goat breeds are maintained under sedentary and house hold system. Milk production potential of Beetal, is 272 in 140 days, DDP 205 in 130 days, Nachi 214 in 160 days. Damani 115 in 100 days, Kamori 204 in 115 days and Kacchan 190 liters (L) 110 days. The average daily milk yield of Beetal is 2(L), DDP 1.6(L), Nachi 1.3(L), Damani 1.2(L), Mamori 1.8(L) and Kacchan 1.7(L) respectively. Potentials of these breeds needs to be further explored. There is a dire need that dairy aspects of goat production should be invested in Pakistan.

Key Words: Dairy goats milk production potential Pakistan.

INTRODUCTION

Pakistan is fourth largest country in terms of goat population following India, China and Bangladesh and third largest in terms of goat milk production in Asia (FAO, 2010). Pakistan has about 34 goat breeds with a total population of 61.5 million heads found all over the country. There are about six million people who keep goats but most of them are landless or have marginal land holdings. The population of goat is increasing at 1.3 million goats per annum in the country (Livestock Census, 2006). The goat breeds are categorized as meat, dairy had hairy types; but the major objective of goat raising is production of meat. However, milk obtained from goat is also important in some parts of the country and goat milk contributes to the health and nutrition of several million people in Pakistan, especially those on the poverty line. Goat milk is of particular significance for the most vulnerable groups like pregnant and nursing mothers and babies who do not like their mother's milk. So we call the goat the poor man's cow. Among different breeds of goats Beetal, Dera Din Panah (DDP), Nachi, Kamori, Kacchan and Damani are classified as dual purpose i.e. both for milk and meat. Among these breeds Beetal is more popular in Punjab because of milk and meat production. Kamori is popular in Sindh province and similarly Damani is Khyber Pukhtunkhwa (KPK). Its production potential is not fully explored which necessitates more research for the exploitation of its potentials.

Goat population and distribution

According to the Economic Survey of Pakistan (2010-11) there are 61.5 million goats (Table-1). From 1996 to 2006, the population of goats increased by 1.3 million/year which is second highest growth rate after cattle (4.4%) population in the country. This trend shows the popularity of goat rearing among the people. Growth rate of goat population is higher during the period 1996-2006 than that for the period 1986 to 1996, as reported previously by Khan (2004)

Table-1 Showing the Goat population (million heads) and distribution in different provinces of Pakistan

Province	1996	2006	2011	Percent Share
Punjab	15.30	19.90	2.76	37.0
Sindh	9.73	12.37	14.15	23.7
KPK	6.76	9.68	11.07	16.0
Balochistan	9.36	11.83	13.53	22.7
Pakistan (Total)	41.16	53.79	61.5	100

Source: Livestock Census (1996 and 2006) Pak. Economic Survey, 2010-11.

The annual growth rate of goat is 3.1 percent which is higher than that for sheep (1.25%). This trend shows the preference of goats over sheep. Punjab has the largest population of goats (37%), followed by Sindh (23.7%), Balochistan (22.7%) and KPK (16%). In some parts of the country, where cow and buffalo milk is not available or limited, goat milk is the main supply for human consumption.

Dairy Goat Population

The dairy goat population shows 11.08 million producing, about 759 Thousand tons of milk annually which is about 2% of the total milk supply in the country. The population of Kachan goat is not included as detailed in Table. 2

Table. 2 Showing the Province - wise Dairy Goat population Million Heads

Breed	KPK	Punjab	Sindh	Balochistan	Total
Beetal	0.65	3.10	0.24	0.21	4.20
Kamori	0.05	0.04	3.90	1.30	5.29
Damani	0.90	0.05	0.03	0.3	1.31
DDP	0.05	0.08	0.02	0.01	0.16
Nachi	0.02	0.03	0.03	0.04	0.12
Kachan	N/A	N/A	N/A	N/A	N/A
Total	1.67	3.30	4.22	1.89	11.08

Source: Livestock Census (2006) (N.A-Data not available)

In Punjab, Beetal is dominant breed with 3.10 million heads because of its preference as dual purpose i.e. both meat and milch animal. According to the livestock census (2006); Kamori is the number one dairy goat breed in Sindh and has the highest population among dairy goats, at the national level. Damani is third dairy goat on population basis, found in the KPK province. Dera

Din Panah and Nachi are famous as dairy goats of southern Punjab (Nachi is found in the southern Punjab in the canal irrigated tracts).

Production Systems

Small Ruminants raised under different production system are tabulated in Table-3. There are found main systems of production for small ruminants namely nomadic, transhumant, household and sedentary in various regions of the country since times unknown. As described by Ishaque (1993), the prevalence of household/sedentary system were highest in Punjab (47 and 27% respectively) and lowest in Balochistan (3%). The study conducted by FAO (2003) presents a different picture than that of Ishaque (1993). According to that small ruminant production is mainly under sedentary and transhumant production systems. However, it seems that due to degradation of rangelands, drought and floods for the last 5-6 years, production system of the small ruminants might have further changed. Due to limited grazing land, shepherds are keeping more small ruminants under sedentary and household systems now.

More shifted of small ruminant production system is observed n nomadic, sedentary and house hold. The sedentary and house hold is more common in Punjab and Sindh provinces, whereas 59 percent sheep and goat under the transhumant system and 3.0 percent under nomadic system in Balochistan (Afzal, 2003). Similarly, transhumant system is also more common in KPK as reported in Table-3,

Table 3 Showing the Distribution of sheep and goat by production system

Production system	1993(%)	2003(%)
Nomadic	44	6
Transhumant	38	32
Sedentary	06	40
Household	12	22

Source: Ishaque (1993), TCP/PAK/0168 (2003)

GOAT MILK PRODUCTION

Goat milk, total and share in Pakistan are both on the increase, over the last few years, which is because of an increase in number of animals but not per animal productivity. Most of milk produced in the country comes from buffalo and cow but reasonable amount of milk also comes from goats as presented in Table-4.

Table-4 Showing the goat milk production in Pakistan 000 tonnes

Products	1996	2006	2011
Goat Milk	527	675	759
Total Milk*	23580	31246	37475
Percentage	2.23	2.20	2.01

Source: Agricultural statistics of Pakistan (2005-06) & Economic Survey of Pakistan (2010-11)

Arid and semi-arid areas where buffalo and cattle milk is not available, people depend upon the goat milk (Khan & Ashfaq, 2003).

Milk Production Potential of Different Dairy Goats

The average milk yield from selected dairy goat breeds of Pakistan namely Beetal goat the highest producers (2 liter/day) of daily milk followed by Kamori (1.8 liter/day), Kacchan (1.7 liter/day) DDP (1.6 liter/day) and Damani (1.3 liter/day) as given in Table-5.

Table-5 Showing the average milk yield of dairy goat breeds of Pakistan

Breed	Lactation Milk yield (l)	Lactation length (days)	Average daily milk yield (l)
Beetal	272	140	2.0
DDP	205	130	1.6
Damani	115	100	1.2
Kamori	204	115	1.8
Kacchan	190	110	1.7
Nachi	214	160	1.3

Source: Isani & Baloch (1096), Rehman & Shah (2003) and Iqbal *et.al* (2003)

The genetic potential does exist from milk production in these breeds of goats in Pakistan. It needs to be exploited through selective breeding and better management.

RECOMMENDATIONS

Pakistan has important dairy goat breeds but no comprehensive research work has been done so far to enhance their productivity. These breeds need improvement through better nutrition and long term selective breeding. Continued selection in dual purpose animals can lead to improved productivity by developing the best dual breeds of the world.

CHALLENGES/ CONSTRAINTS

There are many challenges for goat production in the country. One of the major challenges is inadequate feed, that has limited animal productivity by 60-70% of their genetic potential. To increase the productivity of animals, it is important to expand and make efficient use of available feed resources. The other constraint is non-availability of genetically superior breeding bucks of these dairy goats. Although in the private sector shepherds are keen to keep quality bucks. The third major constraint to productivity of goats is the presence of contagious diseases in the country particularly Peste des Petites Ruminant (PPR), pneumonic pasturellosis and enterotoxaemia. The availability and quality of vaccine is very important for controlling the health problems towards exploiting the full potentials of dairy goats.

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STUDY TO INVESTIGATE THE EFFICACY OF ENERGY CONSUMPTION IN MAIZE CROP SUBJECTED TO VARIOUS TILLAGE PATTERNS AT NARC-ISLAMABAD

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ABSTRACT

The aims of this study were to determine direct input and indirect energy in maize production, to investigate the efficiency of energy consumption in Islamabad, Pakistan. Tillage method constituted the main-plots, which included: Deep Tillage (DT), Conventional Tillage (CT) and Zero Tillage (ZT). Whereas, organic and inorganic fertilizer treatments included; 10,000 kg ha^{-1} FYM and 150-75-75 NPK kg ha^{-1}. Results showed that grain yield, number of grain per cob, 1000 grain weight and plant height were maximum in DT as compared to CT and ZT. Total energy input were maximum with organic fertilizer (OF) as compared to inorganic fertilizer (IF). The output energy was found maximum in IF as compared to OF. The net energy gain was found maximum in IF as compared to OF, in all tillage methods.

Key words: Maize, Energy ratio, Input-Output Energy, Yield-Islamabad Pakistan.

INTRODUCTION

Agriculture sector with its motto for providing more food needed by population increase, like other sectors, depends on energy sources like electricity and fossil fuels (Hatirli, 2005). Energy has been a key input of agriculture since the age of its subsistence. It is an established fact, world wide, that agricultural production is positively correlated with energy input (Since, 1999). Being both a producer and consumer of energy, it uses large quantities of locally available non commercial energy such as seed, manure and animate energy as well as commercial energy, (directly and indirectly) in the form of diesel, fertilizer, plant protection, chemical, irrigation water and machinery. Efficient use of these energies helps to achieve increased productivity and contributes to the profitability, competitiveness, and sustainability in rural living (Panesar 2002). It is important therefore, to analyze cropping systems in energy terms and to evaluate alternative solutions especially for arable crops, which account for more than half of the primary sector energy consumption (Sartori, 2005).

Many developing countries strive for an increase of their agriculture production in order to feed the rapidly growing population. Contrary to many other countries, Pakistan still has the possibility to expand the cultivated area. Maize is one of the most important cereal crops of the world. It is used for three main purposes as human food, feed for poultry and livestock. Maize, being the highest yielding cereal crop in the world, is of significant importance for

countries like Pakistan, where rapidly increasing population has already out stripped the available food supplies. In Pakistan maize is third important cereal after wheat and rice and 89% of the crop is grown in Punjab and Khyber Pakhtunkhwa. Pakistan grows maize on about 1.11 million hectares with annual production of 4.04 million tons of grain and average yield of 3.62 t ha^{-1} (GOP, 2009).

The aims and objective of this study were to determine direct input energy and indirect energy in maize production and to investigate the efficiency of energy consumption, subjected to various tillage patterns, in the agricultural environment of NARC, Islamabad.

MATERIAL AND METHODS

Experimental Site

This study was conducted at the experimental field at National Agriculture Research Centre (NARC), Islamabad, Pakistan, during spring 2009. The site is located at Latitude 33^0 40' North and Longitude 73^0 08' East. The climate data were taken during spring season i.e. the rain fall average 0-125.8 mm, temperature 9^0C-44^0 C, and humidity 22.5%-95%, although maize is encountered as kharif crop.

Experimental Design and Treatment Applications

Keeping in view the objectives of the study, the experiment was designed using Randomized Complete Block Design (RCBD) with three replications. A plot measuring 43 m X 100 m having a total area of 4300 m^2 was utilized in this duty. The plot was divided into sub plots measuring equally to 10 m x 20 m, with one-meter path left between each plot for tractor operation. The ploughing of soil was performed with Deep Tillage (DT) (sub-soiler + Mouldboard plow one pass), Conventional Tillage (CT) (disc harrow + cultivator), and Zero-Tillage (ZT) (drill), with fertilizer rates of 10,000 kg ha^{-1} FYM and 150-75-75 NPK kg ha^{-1} . Seeds of a maize variety Islamabad Gold were dibbled 5 cm deep, keeping row to row distance of 75 cm and seed to seed distance of 20 cm. Maize was sown at the rate of 25 kg ha^{-1} and the complete dose of NPK was applied at the time of sowing. The remaining dose of N was applied in two splits; the FYM was applied to keep the plants at proper distance. Five plants were selected randomly from each plot and tagged. The agronomic observations were recorded as (i) plant height (cm), (ii) 1000-grain weight (g), (iii) number of seed cob-1 and (iv) grain yield (kgs ha-1). Energy equivalents (shown in Table-1), were used for estimation. The amounts of inputs used in the production of maize were specified in order to calculate the energy equivalences in this study. Energy inputs included (a) human labor, (b) diesel fuel, (c) chemical fertilizer, (d) FYM and (e) seed amounts. The output yield included grain of maize, output-input energy ratio, energy productivity, net energy gain and specific energy were calculated. The data were statistically analyzed to see the significance difference among various levels of organic and inorganic fertilizers, in accordance with the basic formulation narrated by (Hatirli, 2005 and Mohammadi, 2008).

Table 1 Energy equivalents of inputs and outputs in maize production

Input	Unit	Energy equivalent MJ/Unit	Reference
Human labor	H	2.3	Yaldiz *et al*, 1990
Fuel (Diesel)	L	47.8	Cervinka, 1980
Chemical fertilizer	kg		
Nitrogen		61.53	Pimentel, 1979
Phosphorus		12.56	Pimentel, 1979
Potassium		6.70	Pimentel, 1979
FYM	kg	3.8	Green, 1987
Seed	kg	14.7	Panesar, 2002
Output			
Grain maize	Kg	14.7	Panesar, 2002

Table-2 Showing the average depth, width, fuel consumption and fuel energy of various implements during spring 2009

Implements	Depth (cm)	Width (m)	Lit.hr^{-1}	Lit.ha^{-1}	EFC Ha hr^{-1}	Energy MJ ha^{-1}
Sub-soiler	27.350 a	1.133e	6.966a	24.140a	0.294	1724.8
M.B. Plow	21.333b	1.766c	6.693b	21.250b	0.318	1519.6
Disc Harrow	10.867c	2.603c	4.018d	7.520d	0.543	585.7
Cultivator	6.917d	2.800a	3.771e	7.660d	0.505	506.5
Zero-Tillage	4.738e	1.688d	5.171c	13.583c	0.376	640.1
SE	0.1803	0.0232	0.0509	0.0779	--	--
LSD	0.4121	0.0483	0.1061	0.1625	--	--

Table-3 Showing the effect of organic and inorganic fertilizers on maize crop production

Fertilizers	Tillage methods	Plant height (cm)	Number of grain cob^{-1}	1000-grain weight (g)	Grain yield (Kg ha^{-1})
150-75-75 NPK kg ha^{-1}	Deep tillage	189.00 a	367.33 a	231.00 a	6110.00 a
	Convention-al tillage	186.33 a	360.00 a	226.00 b	5653.7 b
	Zero tillage	178.00 b	345.00 b	219.00 c	5135.7 c
	SE	1.1386	3.9252	1.7321	63.804
	LSD	3.1611	10.898	4.8089	177.15
Fertilizers	**Tillage methods**	**Plant height (cm)**	**Number of grain cob^{-1}**	**1000-grain weight (g)**	**Grain yield (Kg ha^{-1})**
10,000 kg ha^{-1} FYM	Deep tillage	163.00 a	274.00 a	188.00 a	4169.7 a
	Convention al tillage	160.00 b	264.33 b	186.00 a	3873.7 b
	Zero tillage	155.33 c	251.00 c	184.33 a	3575.7 c
	SE	0.6383	1.2766	2.6387	35.020
	LSD	1.7722	3.5443	7.3263	180.52

RESULTS AND DISCUSSION

Yield:

The field experiment was performed in order to evaluate the productivity of each tillage method and to relate it to the energy consumed. The mean yield results are shown in Table 3. The Analysis Of Variance (AOV) for plant height (cm), number of grain cob^{-1}, 1000-grain weight (g) and grain yield (kg ha^{-1}) in different tillage methods with the application of organic and inorganic fertilizer was used. The results revealed that significant increase in plant height (189.00cm), number of grain per cob (367.33), 1000-grain weight (231.00 g) and grain yield (6110.00 kg ha^{-1}) maximum in deep tillage both organic and inorganic fertilizers as compared to conventional tillage, while minimum in zero tillage.

Fuel consumption:

The diesel fuel consumption and energy for the various systems are shown in Table 2. The results on depth, width, fuel consumption, effective field capacity and fuel energy of implements revealed that average depth of sub soiler was more (27.350 cm) as compared to M.B. Plow (21.33cm), disc harrow (10.867 cm), cultivator (6.917 cm) and zero tillage (drill) with slightly less depth (4.738). The average width of implements were recorded sub soiler (1.133 m), M.B. Plow (1.766 m), disc harrow (2.603 m), cultivator was more width with recorded (2.800 m) and zero tillage (drill) was found (1.688 m). There was significant difference in all depth and width of the implements, as detailed in Table 2.

Table 4 Showing the energy output/input relationship for maize production

Sr.#	Input	Deep Tillage	Convention-- al Tillage	Zero Tillage
1	**Human labour (MJ h-1)**			
	Sowing	184.0	184.0	--
	Harvesting	368.0	368.0	368.0
2	**Diesel (MJ ha^{-1})**			
	Sub soiler	1724.8	--	--
	Mouldboard plow	1519.6	--	--
	Disc harrow	--	585.7	--
	Cultivator	--	506.5	--
	Zero-tillage (drill)	--	--	640.1
3	**Chemical Fertilizer (kg)**			
	Nitrogen	922.5	9229.5	9229.5
	Phosphorus	942.0	942.0	942.0
	Potassium	502.5	502.5	502.5
4	**Manure (kg)**			
	Cow manure	38000	38000	38000
5	**Seed (kg ha^{-1})**	367.5	367.5	367.5

Sr. #	Input	Deep Tillage	Convention -al Tillage	Zero Tillage
6	**Total Energy Input (MJ ha^{-1})**			
	Chemical Fertilizer	14837.9	12685.7	12049.6
	FYM	42163.9	40011.7	39375.6
7	**Output Grain (MJ kg^{-1})**			
	Chemical Fertilizer	89717.0	82815.39	75494.79
	FYM	31294.59	56943.39	52562.79
8	**Output/Input Ratio**			
	Chemical Fertilizer	6.05	6.52	6.26
	FYM	1.45	1.42	1.33
9	**Specific Energy (MJ kg^{-1})**			
	Chemical Fertilizer	2.42	2.24	2.34
	FYM	10.11	10.32	11.01
10	**Energy Productivity (kg MJ^{-1})**			
	Chemical Fertilizer	0.41	0.44	0.42
	FYM	0.09	0.09	0.09
11	**Net Energy Gain (MJ ha^{-1})**			
	Chemical Fertilizer	74979.1	70129.69	63444.4
	FYM	19130.69	16931.69	13187.19

The result on fuel consumed by various implements during land operation were recorded, the results revealed that sub soiler consumed maximum fuel average (24.140 lit ha^{-1}), followed by M.B. Plow (21.250 lit ha^{-1}), cultivator (7.660 lit ha^{-1}), zero tillage (drill) consumed (13.583 lit ha^{-1}) while disc harrow consumed lesser fuel average (7.520 lit ha^{-1}). There was significant difference in all the implements. The results on effective filed capacity of various implements it was observed form the results that sub soiler (0.294 ha hr^{-1}), M.B. Plow (0.318 ha hr^{-1}), disc harrow (0.543 ha hr^{-1}), cultivator (0.505 ha hr^{-1}) and zero tillage (0.376 ha hr^{-1}). With respective diesel fuel energy consumed in sub soiler (1724.8 MJ ha^{-1}), M.B. Plow (15199.6 MJ ha^{-1}), disc harrow (585.7 MJ ha^{-1}), cultivator (506.5 MJ ha^{-1}) and zero tillage (640.1 MJ ha^{-1}) the results revealed that maximum fuel energy consumed by sub soiler and lowest fuel energy consumed by cultivator.

Input-output energy use

The input and output energy values used in maize production are illustrated in Table-4. The total input energy in each operation was recorded inorganic (14837.9 MJ ha^{-1}) and organic (42163.9 MJ ha^{-1}) in deep tillage, inorganic (12685.7 MJ ha^{-1}) and organic (40011.7 MJ ha^{-1}) in conventional tillage and inorganic (12049.6 MJ ha^{-1}) and organic 39375.6 MJ ha^{-1}) in zero-tillage. The results indicated that more energy used in organic fertilizer and less energy used in inorganic fertilizer. The output energy was found in inorganic (89817.0 MJ ha^{-1}) and organic (61294.59 MJ ha^{-1}) in deep tillage, while inorganic (82815.39 MJ ha^{-1}) and organic (52562.79 MJ ha^{-1}) in conventional tillage and inorganic (75494.79 MJ ha-1) and organic (52562.79 MJ ha^{-1}) in zero-tillage.

DISCUSSION

The agronomic observations were recorded as plant height (cm), 1000-grain weight (g), number of seed cob^{-1} and grain yield (kg ha^{-1}) maximum in deep tillage against no tillage these results are in agreement with the finding of Arora *et al* (1991) that deep tillage is beneficial for maize cultivation, Kersten and Hack (1991) observed that best results could be achieved by plowing against no till cultivation. The fuel consumption associated with the different production systems is of great importance, especially to the farmers. The fuel consumption has particular importance to the farmers during times of fluctuating fuel costs and may be of prime importance when choosing tillage methods. Hourly fuel consumption increased with the working depth during ploughing. Filipovic *et al* (2004) indicate also an increase of the hourly fuel consumption with the rise of dept of ploughing. Moitzi (2005) reported that fuel consumption increase per centimeter ploughing dept. The results indicated that more output energy gain in inorganic fertilizer and less output energy gain in organic fertilizer. The net energy gain was found maximum in inorganic fertilizer as compared to organic fertilizer in all tillage methods.

CONCLUSION

Different tillage treatments were evaluated on the basis of plant height and yield components of maize. Deep tillage followed by conventional tillage had the tallest plants and produced the highest number of grain $cobs^{-1}$. Also 1000-grain weight and grains yield were higher under deep tillage treatment. Zero tillage treatment gave the lowest number of grain cobs-1 with small plant height which ultimately resulted in the lowest yields under this treatment. It was concluded that NPK level 150:75:75 kg ha^{-1} and 10,000 kg ha^{-1} cow manure gave more maize yield in deep tillage against conventional tillage and low maize yield recorded in zero tillage and deep tillage used high energy as compared to conventional and zero tillage, for the farmers who can't afford much cost they can be recommended conventional tillage for growing maize crop successfully and economically.

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THE STATUS AND IMPACT OF VARIOUS NGOs IN LIVESTOCK SECTOR OF PAKISTAN:

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ABSTRACT

Twenty Seven (27) Community Based Organizations (CBOs) including Non Government Organizations (NGOs) are working with their credibility, since last two Decades. Only Four (04) out of these are exclusively involved in (i) Farmers Training, (ii) Project Preparations and Implementation (iii) Provision of Various Services to Livestock Farmers and (iv) Publication of Recent Efforts of Scientists in the form of Books, Training manuals. The Pakistan Livestock Welfare Organization has taken the Lead in publishing Pakistan Journal of Livestock Sciences (PJLSc), since 2008. Out of 24 NGOs of Punjab Province, Pakistan Bureau of Agriculture (PBA) established in 1974 in Faisalabad is exclusively involved in Print Media, the Pakistan Veterinarian & Vet News & Views are their exclusive & sustained fortnight efforts and the Vets-Guide an update of vety. Drugs & Vaccines for Livestock Sector. All these efforts keep the Livestock farmers, the Scientists, the Students & Government Officials abreast with the Development in Livestock Sector, with authenticity. Patronage & Financial support by the Federal & Provincial Livestock Departments is recommended.

Key Words: CBOs, NGOs, Livestock Sector Pakistan.

INTRODUCTION

The need of involvement of CBOs/COs and NGOs was felt in Early Seventies when Graduate Students of various agricultural Universities could not reach technical information, the updates in livestock sector specially the data on Livestock namely population, the number of L/S farms, the number of markets, the Symposia & Seminars and various Projects (prepared, executed & with what results??). The Research work being carried out remained limited to the theses of individual students. Some efforts were made in publishing the Pakistan Veterinary Journal (PVJ) of University of Faisalabad (Editor in Chief 2010-2011) and later on the Journal of Animal Health and Production (JAHP) of Veterinary Research Institute (VRI) Peshawar (Chief Editor, 2010) in 1978 followed by the Pakistan Journal of Agriculture Research (PJAR) of PARC in 1985 (Editor in chief 2011) and others, detailed in this article.

The Bureau of Agriculture Information (BAI) of Faisalabad started printed Vety, News & Views (VNV) since early seventees (Anonimous 2010-2011) with very limited resources and this news paper was as earlier planned, is still a popular Fortnightly publication. Smaller CBOs were identified as NGOs when the Strengthening of Livestock Services of Pakistan, project (SLSP) was implemented in Pakistan (Saeed *et al* 2010). These played positive role in getting their 450 members Trained as Community Livestock Extension Workers (CLEWS) and Community Women Livestock Extension Workers (CWLEWS). Most of these workers are practically involved in Livestock activities while majority of them have established their own forms in six selected districts of Punja. Similar COBs were also identified in

NWFP (Khyber P.K) in 2000-2008 in Balochistan in 2000-2000 in AJK in 2006-2007 and more than 174 Formers Trained in Sindh Province.

This paper encompasses the status of such NGOs, and will try to see the impact of such NGOs in improvement of various activities in Livestock Sector in the Country. The credibility & sustainability of these NGOs will also be critically examined in the light of their work being undertaken.

MATERIAL AND METHODS

A set of parameters was devised to make an instrument in assessing the credibility, sustainability and finally evaluating any individual NGOs achievement in the light of their objectives, supported with their Annual Repots followed by Financial / Audit Reports. These parameters included:-

(a) Registration of an NGO
(b) An Introductory Leaflet / NGO Profile
(c) Set Forth Objectives
(d) Any Perspective Vision Plan
(e) Existing Facilities of the NGO
(f) Achievement (salient achievements)
(g) Annual Repot(s) if any
(h) Financial / Audit Report(s), if any
(i) Conclusions(s)
(j) Final Assessment(s)

The following NGOs working in Livestock Sector were selected and were subjected to our instrument towards Monitoring and Evaluation (M&E):-

(i) Livestock Development Foundation (LDF) Regd.-Islamabad.
(ii) Pakistan Livestock Welfare Organization (PLWO) Regd.-Islamabad.
(iii) Bureau of Agriculture Information (BAI) Faisalabad.
(iv) Farsalan Consultancy Services (FCS) Islamabad.
(v) Livestock Foundation (LF) Regd.-Islamabad.
(vi) National Rural Support Project (NRSP), IRM.
(vii) Agha Khan Rurual Support Program (AKRSP).

The data collected was analyzed for comparison and summarized information has been presented in Tables, 1 and 2.

Results

(i) The out put and salient achievements, based on the criteria (as our instrument) showed progress, withir limited resources. The achievements based on their recent Annual Repor's, were found in line with their set of objectives as tabulated in Table -1.

(ii) The existing facilities in terms of Technical manpower (Personnel), the equipments and other facilities were limited but contented as presented in Table – 2.

Table 1 Showing the Summarized Status of Four NGOs Working in Livestock Sector in Rawalpindi – Islamabad Twin Cities.

Sr. #	NGO	OBJECTIVES	PERSONNEL		ESTAB:	YEAR OF SUSTAINABILITY
			Tech:	Support Staff		
01	LDF	Livestock Dev: Activities	05	02	2004	2011-2012
02	PLWO	-do-	04	02	2004	2011-2012
03	LF	-do-	05	03	2006	2011-2012
04	NRSP	-do-	15	21	2002-03	2011-2012
05	BAI	Livestock information	06	05	1968	2011-2012
06	FCS	Livestock Literary Work	04	02	2005	2011-2012
07	AKRSP	Rural Dev: work	08	32	1994-95	2005-2006

NB: In a recent joint meeting LDF, PLWO and FCS have been merged in one Livestock Development Foundation® (LDF).

Table 2 Showing the Summarized Achievements of Various NGOs

S. #	NGO	ACHIEVEMENTS	PERIOD
01	LDF	(i) Farmer Members 185 (ii) Projects Prepared 03 (iii) Projects Approved & Implemented 01	8th Annual Report Published (2011-12)
02	PLWO	(i) Farmer Members 115 (ii) Projects Prepared 04 (iii) Pipeline Project 01 (iv) Pakistan Journal of Livestock Sciences (PJLSc) established 2008	6th Annual Report Published First Published 2009, Vol-III Published 2011 and Vol-IV in progress.
03	BAI	(i) Pakistan Vety. News & Views (Urdu) (ii) Pakistan Livestock (Urdu) (iii) Vets Guide	Continues Publishing w.e.f. 1970 Continuously Published w.e.f.1972 Two editions Published w.e.f. 2005
04	FSC	Seven Publications 03 Training Members 04 Books (List annexed)	Through own Resources
05	LF	(i) Conference Proceedings Published (ii) Sheep & Goats of SAARC Countries 2011 Published	Sponsored Sponsored
06	NRSP	(i) Livestock Farmers Trained (ii) Services Provided	2002-03-2011-12
07	AKRSP	(i) Livestock Farmers Trained (ii) Services Provided	1992-93-2004

Table 3 Showing the Summarized Financial Pictures of NGOs Involved in Livestock Sector in Pakistan

NGO	Joint Account	Sponsored Projects	Own Resources	Annual Financial Report	Annual Audit/ Financial Report	Projects In Pipeline
LDF	Yes	PARC-ALP Funded-AS-137	Yes	Yes	Yes	03
PLWO	Yes	Nil	Yes	Yes	Yes	02
	Yes	Nil	Yes	Yes	Yes	Nil
	Yes	Nil	Yes	Yes	Yes	Nil
	Yes	Nil	Yes	Yes	Yes	Nil

NB: In a recent Joint meeting PLWO has been merged in LDF.

(iii) The achievements of every individual NGO are multifarious and need to be narrated one by one below.

(a) Livestock Development Foundation® (LDF)

(i) Since its establishments has been working sustainably in the light of its objectives (ii) office established and with moderate existing facilities (iii) It has a Perspective Vision Plan LDF-2020.

(ii) An introductory leaflet is available

(iii) The achievements include submission of three (03) Project Proposals one each to Trust for Voluntary Organizations (TVO) (iv) PARC-ALP and Canadian International Development Agency (CIDA).

(iv) The Project entitled "Productions of Genetically supervisor Bulls of Kundhi Bread of buffaloes in Sindh Province" was got approved with a total allocation of Rs.9.414 millions in 2010. The project ran for One & half years, instead of three years, utilizing Rs.3.32 millions supported with all six monthly & Annual Reports, in this project 183 farmers were Registered in Tando Allahyar & 94 Buff: Bulls were produced. The DNA Tests of which was done in Institute of Biochemistry & Biotechnology (IBBT) University of Vety: & Animal Sciences (UVAS) Lahore. One PhD & one M.Sc student was produced with thesis research.

(v) The Seventh Annual Report of LDF comprises all the details Muhammad Hafeez and Mashook Ali Bhutto (2011). The rest of the projects were in pipeline.

(b) Pak. Livestock Welfare Organization® (PLWO)

(i) Was established in 2006, and got registered in 2007. The Executive body Comprised 50% Technical Professional & 50% Progressive Farmers.

(ii) It has a set-forth Vision Plan PLWO-2020

(iii) It helps establishing the Farmer's Societies. Throughout the country.

(iv) It has an established office !. moderate existing facilities.

(v) It has achieved majority of its objective & is working sustainable. Based in Bhara Kahu Islamabad.

(vi) The PLWO slogan still functions, Saturday and Sunday in for Farmers. PLWO has successfully launched two Training Manuals in Urdu Both ISBN: Regd. (2006) as under:-

- Animal Health & Production Workers Training Manual – (10 Days Training Program).
- Participatory Training Manual for Rural Development Involving and Men &Women of 15 Days (2012) ISBN Regd.

(vii) The Sixth Annual Report of PLWO alongwith Financial Report for the year 2011-12 is self-explanatory and working sustainably.

(viii) It has Joint Bank Account & Mostly the work is done an income generation. No funding has been received for any corner yet (PLWO has since merged in LDF ® w.e.f. November-2012.

(c) Farsalan Consultancy Services (FCS)

FCS has a team of technical personnel including the Chief Executive. Their publications include the priced editions, available on cost basis anumerated below:-

- Livestock Industry – Code 782 for M.Sc(Hons) LM Students of AIOU 2008 – English, AIOU – Book Series.
- Livestock Economics & Business Management ISBN Regd.
- Investment in Livestock Sector: A real Business in Pakistan. English – 2009 ISBN Regd.
- Livestock Industry: 2011 Livestock & Poultry Production of Pakistan. HEC – Publications.
- Economic losses due to Livestock disease in Pakistan. English ISBN 2011 Regd.
- Livestock Production – Urdu 2012 code- 254. AIOU – Book Series.
- Basic Livestock Management – Urdu 2012 code – 253.
- Training Manual for AI Technicians in Artificial Insemination – Urdu. ISBN-2012.
- Participatory Training Manual in Rural Development for men and women Urdu-2012 ISBN-Regd.

(d) Bureau of Agriculture information (BAI).

BAI stationed in Faisalabad, the Editorial Personnel are Professionally qualified and dedicated for providing livestock updates through:-

- Veterinary News & View – Urdu Fortnightly newspaper.
- Pakistan Livestock – Urdu fortnight, they have a team of Reporters in all big cities of the country & the readers / clients are thousands. They run their affairs though income generation.
- They have properly maintained Accounts which are audited annually & doing tremendous job.

(e) Network of Rural Support Program (NRSP)

This is well established NGO & helps in assisting Farmers Training & Providing assistance to Livestock Farmers in Punjab, Sindh, NWFP, Balochistan & AJK including NAS.

- NRSP is well organized with nice documented work, Annual Reports Supported by Financial Pictures & Bank Statements, with credibility for the last two decades & on sustainable basis.
- Communities are being organized which have been supported to continue work on self Reliance basis in Livestock sector.

(f) Agha Khan rural Support Program (AKRSP)

This NGO was first introduced in 1990 with international financial assistance in Northern areas specially in Gilgit, Sikardu, Gargche, Diamer and Ghizer districts. The main activities were in the following areas.

- Livestock activities alongwith other Rural support work, were the main focus. Farmers were trained & services were provided for the improvement of Livestock Specially Sheep and Goats.
- The Annual Reports were well documented and they fulfilled most of their objectives.
- This program approach, was discontinued in 2003-04 due to many reasons including stoppage of Financial Resources (Annonimous – 2004).

(g) This Livestock Foundation (LF) is an established NGO with properly qualified personnel. They work on Assignment based tasks and Not being funded by Donors. They have done the following literary work.

- Published Proceedings of Natural Conference on Investment opportunities in Livestock Sector of Pakistan – 2006, Islamabad.
- Sheep and Goats of SAARC countries, 2011. SAARC monogram Services.

(h) Institute of Rural Management (IRM)

This is the largest specialized capacity development institution of the country, not for profit sector, conducting upto 500 different types of trainings with the turn out of around 50,000 trained/skilled persons, annually for the last 19 years IRM has made efforts in capacity building of Development professionals and communities throughout the country.

This is a registered entity under section 42 of Companies Ordinance 1984. This NGO/Company is an ISO 9001-2008 certified entity, has highly organized internal control system in place which includes financial procedures, staff service rules, gender policy as well as administrative processes.

Its major activities include:-

- **Community Training Program (CTP). This covers the following areas:**

  (i) Vocational training program (VTP)
  (ii) Social Sector Training Program (SSTP).
  (iii) Environment and Natural Resource Management Program (ENRMP)
  (iv) Social Mobilization Training Program (SMTP)

During 2010-11 a total of 47,494 participants have been trained under CTP which includes 27725 men and 19769 women.

- **Staff Training Program (STP)**

  This covers the following areas:-
  (i) Management Development Program (MDP).
  (ii) Social Mobilization Training Program (SMTP)
  (iii) Micro-finance Training Program
  (iv) Internship Training Program
  (v) Academics

The Annual Report of IRM for 2011-12 has been published.

CONCLUSIONS

- Based on the assessment of available information and using the set criteria (as an instrument) it can easily be inferred that the NGOs reported so far, are doing their job with dedication and on sustainable basis.
- Being always short of Funds, they need to be funded by Local or International donors to keep them involved in Livestock affairs and that these will continue help assisting the Livestock Departments, the Ministries and Research Institutions, including Teaching Institutions.

RECOMMENDATIONS

In the light of above information & our assessment it can be recommended that NGOs working in Livestock Sector be involved in various meetings of Apex bodies at Federal as well provincial levels.

- These NGOs must be given due patronage by the concerned Ministries & Line Departments of the country.
- GOP must financially help these NGOs for the tasks they have taken up, so that these may not feel deprived.
- GOP and International Donors should support these NGOs on project based proposals.
- Livestock Sector, with Government Interventions, cannot achieve 100% targets until the stake holders such as NGOs are not involved.

- These NGOs working with Livestock farmers dwelling with entities on literary work must be provided necessary Equipments on grant-in-gratis basis, so that they can work with more enthusiasm & dedication.

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THE GROWING PROSPECTS OF PRIVATE SCHOOLS AND COLLEGES SYSTEMS IN RURAL AREAS OF ICT ISLAMABAD

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ABSTRACT

Since the last decade, there has been increasing trend of influx of private School / College Systems in the Rural Area of ICT Islamabad, Specially Zone-IV and recently declared Distt. East. Sixteen (16) Schools / Colleges of SSC & HSSC level are not only showing increased enrolment but their merited Students are joining Professional Colleges & Universities. This study was based on the questionnaire devised by the Faculty of Education AIOU for carrying out Research Studies of Schools & Colleges. It was concluded that 76 Teachers of the 16 School / colleges Systems, mostly with Masters Degrees, in their subject, were coaching 1644 Students of 980 (60%) SSC & HSSC 658 (40%) levels. In the Same Survey, Conducted by the team of authors, revealed Eight (08) Primary Cum Middle Schools were functioning on organized basis since last two decades. Wherein the number of teachers were 38 who were coaching 480 boys & girls students of 6–12 years of age. The Statuses with infrastructure, availability of equipments, furniture, library, computer equipments & audio-visuals have also be described with Recommendation of possible financial support by the M/O Education, GOP for encouraging these Institutions.

Key Words: Private Schools – Colleges Rural Areas ICT – Islamabad Pakistan

INTRODUCTION

Islamabad Capital Territory (ICT) has recently been split into Two Districts (i) Islamabad Distt. West (IDW) and Islamabad District East (IDE) and the IDE comprises 11 (eleven) Union Councils spread over 27 villages while only three (03) Union Councils fall in IDW.

A survey was conducted to assess the Present Private Sector Education. Using status the Educational Survey Performa devised by Muhammad Hafeez 2011.This Survey study was based on a task entrusted to two Post Graduate Students, one being the School Teacher of two private schools out of twelve schools, of Zone-IV of IDE and the other Co-Researcher remained principal of one of these private school systems, in Union Council Bhara, Kahu, Islamabad.

There are Six (06) FG (Boys) Higher Secondary Schools recently designated by the Directorate of Education FA Islamabad as Islamabad Model School while there have been influx of more than one dozen various Schools and colleges systems introduced in ICT, rural areas of Bhara kahu, Tarlai Thanda Pani, Kotli Sattian Road and elsewhere.

The Background of main town of Islamabad Distt. East, the Bhara Kahu has got developed with fastest speed, as compared to bigger sectors of I-10, I-9, F-7, G-7, G-8, G-10, G-11 & F-10 where private investment has surpassed a billion Rupees. Small towns/Abadies & Dhokes have been developed by mostly the investments of retired govt. servants, business community and private property dealers. These new sub townships include Madina Town,

Usman Abad, Muslim Town, Malik Abad, Abdullah Town, Dhoke Jeelani, Kot Hathial, New Abadi (Nai Abadi), Bhera Sayyedan, Mangu Town, and at least one dozen Mohallas namely Nain Sukh, Mohri, Rajgan, Kyani Road, Dhoke Sayyedan and Noor etc. etc. The population growth rate is 2.6% and is applicable in all localities of the country. More than 2000 students are studying in 12 private schools whereas only 800 – 900 students are being taught in 06 FG Boys & One FG Girls HSS schools, in Bhara Kahu alone.

This study was conducted based on a survey proforma, as an instrument, to assess the real credibility of Private School & College & their impact on dissemination of Science & Humanities domains of our education, to the teenagers with prospects of sending such students for graduation or for professional studies in the Universities.

The Status of Education in the Country

(i) According to Pakistan's Social and Living Measurement (PSLM) 2010-2011, literacy rate was 58% (age greater than 10). Although in 2008-09 literacy rate was 97%. Literacy rate was greater in number in urban areas and it was less in rural areas. Men are more literate than women.

(ii) Provinces literacy rate of provisionally was in Punjab 60%, Sindh 59%, KPK 50% and Balochistan 41%. In Primary level in the year 2010-11 literacy rate increased and it raised / touched to 92%. It increased litter bit in Punjab while in Balochistan literacy level was down to 74%.

(iii) Total educational enrolment in the year 2010-11 was 39.9 million while in the pervious year it was 382 million. In 2012 it is expected that 41.6 million students will be enrolled. In 2010-2011 total number of educational institutes was 227.8 thousand (22 lacs and 78 thousand) and it is expected to reach 228.3 thousand in 2012 (22 lacs eighty three thousands). The total strength of teachers in 2011-2012 was 1,409.4 thousand (one crore 40 lacs and ninety four thousands) it was 1,386.1 thousand in 2009-2010 (one crore thirty eight lacs and sixty one thousands). It is expected that the strength of teachers is going to be 445 thousands in 2012 (one crore forty four lacs & fifty thousands) as estimated by Pak. Economic Survey – 2012.

(iv) 134,118 teenagers got technical education according to Presidential Technical Program. (PTP) and Skillful Prime Ministers Program (SPMP)

(v) HEC has given many scholarships for betterment of higher education, 3572 students went abroad for higher education and 1650 students completed heir education through these scholarships. This included majority of merited student out of Non Government / Private Institutes. while lesser % was from the Govt. Institutions & Universities, as reported by HEC (2011-12), Islamabad.

(vi) The Enrolment of SSC & HSSC level students of Allama Iqbal Open University have crossed 0.5 millions (five lacs) in both the semesters of 2011 (Autum) and 2012 Spring, respectively.

It is evident that the Private Institutions have come forth to shoulder the responsibilities to produce merited students with 50% to 60% who could not get admissions due to many reasons viz (i) less number of seats available (ii) the merit of Islamabad Model HSS Schools is not less than 60% (iii) Govt. Schools & Colleges have limited facilities and less number of Teachers available who are subject specialists.

MATERIAL AND METHODS

1. The instrument of assessment of any educational Institute was based on a questionnaire. This comprised the status, the qualifications of teachers, building, equipment, strength of students and sustainability of any system in result oriented academia, preparing students for higher studies.
2. All the 12 Schools & Colleges detailed in table – 1 were provided with the questionnaire & the response was obtained in a shortest possible time of One Week.
3. The data thus collected was analyzed based on each parameter of (i) Status, (ii) Academic Qualifications of Teachers, (iii) Strength of Students in a class & total Strength of School/Colleges (iv) Sustainability of the system with (v) Duration of any Institution alongwith (vi) Teaching aids (equipments, audio visuals) and (vii) Extra curricular activities.

RESULTS

The summarized results have since be a presented in table – 1, 2, 3 & 4 while individual School / College System's results & achievements have also been elaborated as under:-

(i) **Ghazali College for girls**, Bhara Kahu was established in 2004 for FA / FSc. classes in private sector. The summarized brief is enumerated below:-

- They started BA / BSc. classes w.e.f. 2007-2008.
- All teachers are Master Degree holders.
- They are merited and producing 100–140 FA/FSc. Girl student since 2006.
- They have computer & science labs.
- Audio visual system in perfect condition.
- Their building is rented.

(ii) **Sultana Foundation School & College System** was functioning sustainability since 1994. the summarized brief is depicted as under:-

- They are basically an NGO.
- Now they are furnishing sustainability based on No-profit-No-loss.
- There strength of Students SSC is 270 and HSSC as 110.
- Their result is always 70-78% both at Matric & FA levels.
- They have Sciences & Computer laboratories.
- All their teachers are Masters Degree holders with additional Educational qualifications.

(iii)**Rawalpindi College of Commerce (RCC)** Bhara Kahu Campus was established in 2006-07 and are limited to FA / FSc. I.Com and D.Com course. Their summarized brief in given below:

- They are in a rented building.
- Their teachers are all Master Degree holders.
- They have a good computer laboratory.
- They have started B.Com classes since 2009-2010

(iv) **Police Foundation Model School** Bhara Kahu was established in 1994. The summary brief is given below:-

- And since then, Middle and Higher School classes are continued.
- They are co-education
- A nice uniform, disciplined & Merited.

Table 1 Showing the list of private schools and colleges of rural areas of ICT, Islamabad

Sr. #	School/College	Year FSTD	Ranking Level	Status	Progressing Years
01	Police Foundation Public School, Bhara kahu, ISBD	1993	Middle and Secondary	Regd. Co-Education	19 years
02	Rwp College of Commerce, Bhara Kahu ISBD	2005	HSSC	Regd. Co-Education	07 years
03	Sultana Foundation Education School System, Tarlai, ISBD	1990	Middle SSC & HSSC	Regd. Co-Education	22 years
04	PIES School & College System, Bhara Kahu, ISBD	2006	Middle HSC & HSSC	Regd. Male Section	06 years
05	Schollars College & School System, Bhara Kahu, ISBD	2008	Middle HSC & HSSC	Regd. Male Section	04 years
06	Mukhtar School & College System, Bhara Kahu, ISBD	2009	Middle HSC & HSSC	Regd. Co-Education	03 years
07	Ghazali System of Colleges for Girls, Bhara Kahu, ISBD	1994	FA	Regd. Ladies	18 years
08	Women International System of Education (WSE), Bhara Kahu, ISBD	2007	Middle HSC & HSSC	Regd. Co-Education	05 years

Table -2 Showing the private educational academies of Islamabad

S. #	Academy	Timings	Subjects	Ranking Level
01	CSS Oriented Educational Academy, Bhara Kahu, ISBD	Morning and Evening	Arts & Science	SSC, HSSC, Graduate Level
02	FALCON Academy, Bhara khu, ISBD	Morning and Evening	Arts & Science	SSC, HSSC, Graduate Level
03	Science Superior Academy, Bhara Kahu, ISBD	Morning and Evening	Arts & Science	SSC, HSSC, Graduate Level
04	Al-Noor Educational Academy, Bhara Kahu, ISBD	Morning and Evening	Arts & Science	SSC, HSSC, Graduate Level

Table 3 Showing the list of federal government schools and college of ICT, Islamabad

S.#	Name	Status	ESTD	Progressing Year
01	FG (Boys) BS Kiani Model HSS, Bhara Kahu, ISBD	SSC and HSSC	1990	22 years
02	FG (Boys) Model School Col. Amanullah Road, Bhara Kahu, ISBD	SSC and HSSC	1998	4 years
03	FG (Girls) Model HSSC, Kot Hathial, Bhara Kahu, ISBD	SSC and HSSC	1990	22 years
04	FG (Boys) Model HSSC School, Pind Begowal, ICT, ISBD	SSC and HSSC	1992	20 years
05	FG (Boys) Model HSSC School, Tarlai, ICT, ISBD	SSC and HSSC	1990	22 years
06	FG Poly Technical Institute – MERA Begowal, ICT, ISBD	03 years Diploma Course	2002	10 years

Table 4 Showing the Strength of students teaching staff and equipments position of various private institutes of ICT, Islamabad 2011-2012

Sr. #	Institution	Total Students	Total Teachers	Equipments
01	Police Foundation Public School, Bhara kahu, ISBD	180	07	Computer Lab
02	Rwp College of Commerce, Bhara Kahu ISBD	160	05	Computer Lab
03	Sultana Foundation Education School System, Tarlai, ISBD	310	10	Computer Lab Science Lab
04	PIES School & College System, Bhara Kahu, ISBD	180	06	Computer Lab Science Lab
05	Schollars College & School System, Bhara Kahu, ISBD	140	06	Computer Lab Science Lab
06	Mukhtar School & College System, Senior Section, Bhara Kahu, ISBD	095	07	Computer Lab Science Lab Audio Visuals
07	Ghazali Colleges (Ladies) Bhara Kahu, ISBD	130	06	Computer Lab Science Lab Audio Visuals
08	Women International System of Education, Bhara Kahu, ISBD	78	05	Computer Lab Science Lab Audio Visuals
09	Model Islam and Science Schools (MISS), Bhara Kahu, ISBD	112	06	Computer Lab
10	Al-Noor School & College, Bhara Kahu, ISBD	36	04	Computer Lab Sciences Lab
11	Allied School & College, PTV Colony, S/Dara Road, Bhara Kahu, ISBD	83	08	Computer Lab Sciences Lab

Table 5 Showing the status, strength of students, teachers and equipments in primary/middle schools of ICT, Islamabad 2012

Sr.#	Institution	Students	Teachers	Equipments
01	The Genius Model School, Bhara Kahu, ISBD	76	04	Computer Lab
02	Best Future School Pind Begowal, ISBD	130	05	Computer Lab
03	Angellique School System Junior Section, Bhara Kahu, ISBD	186	07	Computer Lab
04	Dar-e-Argam School, Bhara Kahu, ISBD	70	04	Computer Lab
05	The Toodlers, Bhara Kahu, ISBD	65	05	Computer Lab Audio Visuals
06	The Educators Junior Section, Bhara Kahu, ISBD	140	06	Computer Lab Audio visuals
07	The Mukhtar School & College System (Junior Section), Bhara Kahu, ISBD	74	03	Computer Lab Science Lab

- Some teachers are Masters Degree holders while 04-05 teachers are graduates.
- They have Computer aids in higher classes.
- They are also running on No-profit No-loss basis.
- Their main Campus is in I-10, Islamabad.
- They are planning to start HSSC classes as per plan of work.

(v) **PIES Schools & Colleges System** has recently been established in 2009-10 in Bhara Kahu. The summarized brief picture in narrated below:-

- Nice Uniform, Merited & Disciplined Institution whose strength is increasing year by year.
- They have complete Computer Laboratory.
- They have Science Laboratories moderately equipped.
- Their teachers are Mostly Master's Degree holders with some additional educational qualification such as B.Ed, M.Ed.
- They claim to be working on No-profit No-loss basis.
- They are in a rented building but plan to have their own building in future.

(vi)**Scholars Public School & College** has also recently been established in 2008-09. An overview brief is as under:-

- They have one Junior & one Senior Section. All the teachers are Masters Degree holders, except two.

- They have complete Computer Laboratory.
- They have moderate Science Laboratory.
- They observe Summer Campus, annually.
- They observe Teachers – Parent Meetings annually.
- They have extra Curricular Activities.

(v) **Mukhtar School and College System** has also been introduced in Bhara Kahu recently in 2008-09. Some salient features are narrated below:

- They are Co-Education.
- Majority of Teachers are Masters Degree holders.
- They also claim to be on No-profit No-loss basis.
- They have complete Computer Laboratory.
- They have moderate Science Laboratory.
- They have extra Curricular Activities.
- They are rented building but plan to leave their own building in future.

(vi) **The Allied School & College System** is situated in PTV Colony – Simly Dam Road, Bhara Kahu, Islamabad. Some points of specifications are as under:

- They have Rented Building.
- Computer Laboratory.
- Science Lab moderately equipped.
- Science teachers with graduation and Masters Degree holders.
- Computerized Result System.
- Summer School Activity.

(vii) **Islamabad Poly Technique Institute / College** was recently established in 2009, in New Abadi, Bhara Kahu, Islamabad. Their summarized points are as under:-

- Rented Building.
- Four Technologies introduced. Electrical, Civil, Electronics & Chemical.
- One year Diploma Course being offered.
- Students 74, Teachers 06 (02 Engineers, 03 DAE and 01 Principal with DAE).
- Computer Laboratory.
- Practical Labs in developing stage.

DISCUSSION

Private Sector Schools / Colleges are producing a minimum of 1500 to 1600 students, on an average, each year, in the Rural Areas of ICT, Islamabad Distt. East. The number of teachers coaching these youngsters is 76 in all the 15 private Institutions. Similar Studies have been made by the MSc Teachers education, MA, EPM and M.Ed students of Allama Iqbal Oen University, based on questionnaire (Hafeez – 2011) since 2002 (Javed Iqbal, *et.al*) not only for FG (Boys) & FG (Girls) but also FMC (B) & IMC (G) including students of the

University. Reports have also been published in assessing difficulties / constraints in teaching staff e.g. Dyslexia (Uzma *et.al 2011*), Need of teaching Equipments & Lab: requirements (Anonimous 2011) and subjects of curricula & syllabi of Private Institutions (Hafeez – 2011). This was also discussed in various Committee of Courses Meetings Matric & FA of AIOU Courses by Hafeez (2011) and in Developing on-line courses of codes 313-FA & 211-Matric, as professional courses of Dairy Farming and Poultry Farming at AIOU – Courses, respectively. Such courses need to be included in Private Schools and Collages.

The Principals & Heads of various Private Institutions of Rural Areas of Bhara Kahu & Tarlai have taken the lead to shoulder the responsibility of coaching students with a little less meriting. Those who cannot get admission of FG Model Colleges of Islamabad. Just for 04-05% marks. A student being First Divisioner was not admitted because there was no Seats available while he obtained 53-54% marks, aggregate (CGPA). There are many such examples. Now there is a need to establish two Degree Colleges one each for Boys & one for the girls students, followed by upgrading these to Post Graduate classes in the years to come, in Private Sector, supported financially by the M/O Education and/or Financial Assistance of Donors.

CONCLUSIONS

- All the 10 Higher Secondary level, One Poly Technical Institute / College are doing their job to the best of their resources & infrastructure.
- These institutions are catering the youth of Bhara Kahu in grooming their knowledge & education for competition of getting admission in Professional Colleges and Universities of Islamabad & Rawalpindi.
- These Institutions also show a sense of sharing the influx of enrolment in Govt. Institutions (all FG Boys & Girls Higher Secondary/Model Schools in this locality).
- These Institutions are also the source of jobs for Science Graduates & Masters Degree holder personnel who are locally available.
- It is concluded that 76 Teachers, Mostly with Masters Degrees, in their subject, are coaching 1644 students of SSC & HSSC level in 15 Private Sector Schools/Colleges Systems while only 38 teachers mostly graduates are coaching 480 Primary & middle stand students in the area.
- These Institutions are always limited to No-profit No-loss basis, confined to their income generated from tuitions fee etc.
- The Teachers are not handsomely paid as compared to Govt. School / Colleges due to limited financial resources.
- A project proposal needs to be prepared for financial support to these Institutions, if they become identified as registered Private Sector School Association.

RECOMMENDATIONS

- The Govt. of Pakistan of Ministry Education alongwith Federal Directorate (General), of Islamabad must provide Grant Assistant to these dedicated Institutions / Colleges.

- A project proposal can be prepared to provide these Institutions (i) Recent Equipment, (ii) 50% Salary as incentive to all qualified teachers, (iii) Computer & Science Laboratories be strengthened in kind (equipments, chemicals, glassware & miscellaneous supplies), based on actual requirements of individual Institution.
- Building Rent to the tune of 50% of the actual may also be arranged as financial support to these Institutions.
- One graduate level college, each for Boys & Girls be established by the Private Sector supported financial assistance by the M/o Education, GOP, Islamabad and/or Financial Donors.
- Special quota of Scholarships, to at least 10% of the merited students who qualify upto 80% of the total marks be granted by the M/O Education, every year.
- Special honoraria to dedicated teachers with 90% results, comprising 30%. First Division, in Higher Secondary School level, be also granted each year.

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AN INITIAL APPROACH IN PRODUCTION OF GENETICALLY SUPERIOR BULLS OF KUNDI BREED OF BUFFALO IN SINDH PROVINCE

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ABSTRACT

A total of 94 (ninety four) Genetically identified calves of Kundi Breed were observed for growth, from the average age of 4-6 months upto 20-22 months during the period March-2010 to June-2011. After success three rejections (I, II & III) out of 231 totally identified male calves taken from bull mothers categorized Elite, (17-20) A+(15-16), A (14-15), B+ (12-13) and B- (10-11) liters of milk respectively. The investigations of growth trends were recorded fortnightly on R-I proforma, for Body Wight (BWt), Heart Girth (HG) Body Length (BL) and Scrotal Measurements (SM) first by inches tape in centimeter (cm) followed by Digital Weighing Blanc for Body Weight placed very near to 3-4 villages out of 21 village of Tando Allahyar. These calves were kept with 56 Registered Farmers, out of 183 Farmers (earlier Registered) before Rejection. The data of 18 months of calves grown to be bulls has been summarized. The Six Monthly, Annual & Financial Reports are available with the Livestock Development Foundation® (LDF) & Pakistan Agricultural Research Council (PARC)-ALP Offices at Islamabad along with Audit Reports. The registered calves (N-94) with the initial average age of 5-6 months and the Av: age at the time of one and half year being 16 to 20.7 months attained the body Wt: of 231.8, 291, 300.5, 310.5 and 258 kgs in Elite, A+, A, B+ and B categories respectively. The average cost of newly produced bull of Kundi Breed of Buffaloes was Rs.1,40,000/- each, by the end of the second year of the project (November-December,-2011). The total cost of these Genetically tested bulls (N-94) was worth Rs.13.20 millions whereas the total cost of the project was Rs.9.414 millions for three years (But was stopped in the middle, after one & half years). During the project period (January-2010 to June-2011), eleven documents namely 1st, 2nd and 3rd 6th Monthly Progress Reports, Technical Reports of First Farmers Training (FFT-I) April-2010 and Second Farmers Training Report (SFT-II), May-2011, Proceedings of the First Orientation Seminar at SAU Tandojam including Final Report & Audit Reports. This research cum productive work was carried out by LDF, supported financially by PARC under ALP-AREF grant of an approved project No.AS-137 for three years (2010-12) The SAU Tandojam and UVAS played their key positive role as coordinating scientific Institutions in this project. The financial sanction approved was Rs.9.414 millions, for three years. The total duration of the project but upto one and half years (mid of the project) Rs.23.1 millions were utilized. The main expenditure included funding of one MSc.(Hons) student of SAU Tandojam, One PhD Student of UVAS Lahore, feed and fodder cost of Rs.500/- per month to registered farmers for each male calf, TAs/DSAs, equipments, farmers training kit including two framers trainings in Animal Health & Production and One National Seminar (First Orientation Seminar) and miscellaneous expenditure. The Mid-Term Monitoring and Evaluation (M&E) supported the continuation of the project but was stopped due to devolution of Ministries and Financial Constraints. The paper ends with conclusion and recommendations for continuation and conservation of DNA tested bulls of Kundi Breed for increased Milk and Meat Production.

Key Words: Male Calves Growth Trends Kundi Buffaloes Genetic Assays Sindh Province Pakistan.

INTRODUCTION

A project proposal prepared on ALP-PARC format was got approved (Project No.AS-137) with a total cost of Rs.9.414 millions with its objectives being the selection of male buffalo calves from those Bull Mothers(BMs) producing daily milk of 17-20 liters, Categorized as (Elite), 15-16(A+), 13-14(A), 11-12(B+) and 10 liters as (B) while lessthan 8-9 liters were categorized as "C". and was not selected for our studies. Growth pattern was studies right from the initial age of 6 months every fortnight. Most of the workers have donethis work in Body Measurements, such as Vamanoharan *et.al* (2001) in charaolais weaned bull calves, Karima *et.al (1993)* on Egyptian Buffaloes, Bongso *et.al (1984)* in Swamp buffales, Pawan Singh *et.al (2010)* in Murrah Buffaloes, Abdelhadi and Babikar (2011) in Zebu Cattle, Younis *et. Al (2003)I* in Nili Ravi Buffaloes and Weerasirghe *et.al (2009)* in cross breed buffaloes in Srilanka.

Production of Genetically Superior bulls of Kundi breed of buffaloes was much discussed in various meetings in MINFAL GOP, Islamabad in Provinancial Directorate of L&DD, Hyderabad, SAU Tandojam and PARC wherein. The average milk production was not more-than 08(eight) liters, per day, evidenced from various reports, (with exceptions of 14-15 liters of milk, as can be traced). The project was initiated and executed by the Livestock Development Foundation (LDF) a Registered NGO, with its technical and Financial Credibility. The project area was 13 Unions Councils out of 21, of District Tando Allahyar, Sindh Province. The project practically started in Februayr-March-2010 and the Registration of 203 male calves of Kundi Breed, Kept with 183 (Regd) farmers. After successive rejection I, II & III, only 95 male buffalo calves were on our list in December, 2010 (One died in Floods, in Oct-2010) and in January-2011, the number was 94.

The Genetic assay was never initiated earlier and this approach was done to enlist Kundi Buffaloes on the International Genomic Data, Based on the Dendogram presented by our National Coordinating Scientist of UVAs, IBBt, Lahore Masroor, E. Baber (2010) supported by the National Coordinating Scientists from SAU Tando Jam, as presented in the First Orientation Seminar, K.B. Mir Babar (2010), appreciated by ASD PARC-ALP authorities (2010) (2011), Director General L&DD Sindh and Director General SARC-Karachi U.N. Khan (2010-2011)

As per requirements, Six Monthly Progress Reports First, Second and Third including Final Report together with completion Report were submitted to PARC-ALP authorities. Summarized Salient achievements were also submitted to al quarters. One PhD student of IBBt, UVAS Lahore and one MSc(Hons) student of SAU Tandojam have completed their work. PARC authorities need every appreciation to accord financial sanctions for this project out of ALP-AREF grant assistance program for such a precious work. The project lasted for one and half years (Financially) and practically for two years instead of three years, due to devaluation of Ministries & Budgetary constraints. The genetic analysis of 120 blood sample of male calves alongwith bull mothers comprised DNA extraction and quantification, proper labeling Cryo-presentation and specific primer designing in First Six Months. This Diaper Tagging was done as 732-750, K-750-K-840(90) samples These samples pertained to 109 male calves while 04 bulls mothers of kundi breed of buffaloes registered in this

project. The Second Six Monthly work comprised Primer Synthesis for Mitochondrial Loop and Cytocrome (From USA) for parentage analysis, Primer Optimization and Cytocrome Bgene (from USA) for breed confirmation. The Third Six Monthly work comprised Primer designing of Micro Satellite Markers from bovine genomes synthesis and optimization including genotyping of micro satellite markers. The work pertaining to genetic testing through RFLP and squeezing and final evaluation by bio-information tools, ranking of the animals was pending from want of funds.

MATERIAL AND METHODS

1. Initial age of male calve 5-6 months (No-223) identified and kept with farmers.
2. Fortnightly measurements of Body Length (BL), Girth Length (GL), Body Height (BH), followed by Scrotal Measurement (SM), by Digital Weighting Balances placed at Junction villages of chamber and Nasarpur of Tando Allahyar district.
3. Rejections I, II & III in May, 2010, July-2010 and December, 2010 were made respectively, based on rejection criteria being any discoloration, white hair in tail or body and other dundi buff. Calves characteristics.
4. Final 94 remained in January-February-2011 and upto December-2011.
5. Animal Health Care Comprised. Prophylective Vaccination with HSV, FMDV, BQV, and ASV including deworming (twice) and spray of acaricides (twice) against ectoparasites.
6. Proper Statistical analysis was employed to get the averages, Standard Deviations (SD), Standard Errors (SE) and Summarized tabulated data has been presented in the results.
7. The DNA assays were done in the Institute of Bio-chemistry and Biotechnology (IBBt) UVAS, Lahore as per standard procedure laid down by M.E. Baber (2010).

RESULTS

A summarized data of number of calves, Registered and categorized with bulls mothers milk is presented in table No.01 below:-

Table 1 Showing the summarized registered calves with their bull mothers milk produced, in Tando Allah Yar Project No. AS-137.

Sr.#	Category	Bull Mothers Milk	Total number male calves	Remarks
01	Elite	17-20	03	DNA Tested
02	A+	15-16	23	-do-
03	A	13-14	25	-do-
04	B+	11-12	27	-do-
05	B	10	16	-do-
Total Number			**94**	
06	C	8-9	12	Rejected

NB: Rejected Less than 10 liters, Not Recommended for DNA testing to avoid expenditure and energy.

The growth of calves in terms of Body Weight (B.Wt) calculated Heart Girth (HG) and Body Height (BH), using inches tape measurement, simultaneously supported with Digital Electronic Balances. This was done twice each month, from 5-6 months of age upto 22-23 months of age showed increasing trend is presented in Table-No.2 below.

Table 2 Showing the Growth date of Body Wt: of Registered calves of Kundi buffaloes in Tando Allahyar (Project No. AS-137)

Sr. #	Range	Average Body Wt: based on BL, BH & HG				
		Elite	A+	A	B+	B
01	Minimum	220.7	230.5	229.3	227	192
02	Maximum	243.8	351.5	371.6	394.8	439.4
03	Average	231.8	291	300.5	310.5	258

The DNA tests of registered calves (with some bull mothers) from blood (WBCs), carried out at the Institute of Biochemistry and Biotechnology (IBBt) University of Veterinary and Animal Sciences (UVAS) Lahore. Individual DNA numbering were allotted and the work done is presented in table No.3.

Table 3 Showing the DNA IDs of registered male calves and the process of DNA test assays in Kundi Buffalo Calves at Tando Allahyar

Sr. # Groups	Name	DNA-IC	Test-I	Test-II	Test-III
Elite	03	Proper labeling	Specific Primer Design	Parentage Analysis	Primer synthesis Cytocrome Bgene
A+	23	732-750 K750-K840	..	..	..
A	25	(90) sample	..	..	..
B	27	..	..	..	..
B+	16	..	..	..	..

Rejections

The male calves were rejected on the basis of phenotypic de-formalities, discoloration of body hair coat, and/or the appearance of white hair in the face, in legs and switch of tail. Table 4 reveals the rejection of male calves of this study.

Table 4 Showing the rejection of Kundi Buffalo, Male Calves Registered in the Project "Production of Genetically Superior Bulls in Tando Alahyar"

Sr. #	Month	No. of Calves Registered	Rejection-I	Rejection-II	Rejection-III	Total
01	March April-2010	28	..	..	..	28
02	June 2010	83	..	..	..	83
03	August 2010	203	76	..	..	137
04	Dece: 2010	137	..	37	..	100
05	Jan: 2011	100	..	..	05	95
				One Died in Floods	01	94

Scrotal Measurements (SM) were also taken when the male calves grew at the age of one year. The data collected of male registered calves from 12 months of age to 20-22 months of age has shown positive increase, as presented in Tale No.5 below:-

Table 5 Showing Scrotal measurements of Registered Male kundi buffaloes calves of Project No.AS-137 at Tando Allahyar.

Sr. #	Quarter	Scrotal Measurement (cm)				Remarks
01	Second Quarter July-Sept: 2010	NIL				Not yet the age of one year
02	Third Quarter Oct-December:2010	NIL				
03	Fourth Quarter	Elite	A+	A	B+	B
	Jan-March: 2011	14.5	13.	15.8	18.6	16.3
04	Fifth Quarter	17.6	19.4	23.6	26.3	24.8
	April-June: 2011 July-Sept: 2011	24.8	26.7	31.3	35.6	33.3
Further study was stopped due to stoppage of the funding						

SIGNIFICANT ACHIEVEMENTS

- Initially 183 farmers, with 203 male calves were identified and registered Out of which only three did not agree with this program. The project remained limited to 12 out of 103 villages of 13 Union Councils of one District, Tando Allahyar, Sindh South.
- First Orientation Seminar (FOS-I) and First Farmers Training (FFT-I) were organized in October-2010 while Second Farmers Training (SFT-I) May-2011 respectively (for 10 days each) in which all registered 58

farmers participated. There was marked difference before and after these trainings in the Animal Health & Production Practices in the sheds of the registered calves, as well as their herds.

- ❖ All formal Six Monthly Reports, Annual Reports and Reports of Farmers Trainings including the Proceedings of the Seminar were documented on the requisite format and copies sent to PARC-ALP Authorities, DG L& DD Department. Sindh, SAU Tandojam and UVAS Lahore including SARC-Karachi and elsewhere.
- ❖ In addition to Formal Agreements with farmers (on stamp paper) the Pamphlets in Sindhi Language, the Training Manual used in Training Program, (Animal health and Production Workers Training Manual) earlier written by Muhammad Hafeez (2006) in Urdu (ISBN-Registered) was got translated Dr. Javed Ali Gadahi, (2010) and one copy each was distributed to registered farmers, at the time of two trainings.
- ❖ Hundred percent (100%) Animal Health Coverage was provided to registered male calves including their bull others, as well as Herd Health Program on the Deras, of farmers. The Herd was from 4-5 animals (the maximum number of a herd). The animal health care including vaccination of buffalo calves with four bacterial (HSV, BQV, ETV and ASV) and one Viral (FMD) Vaccine, twice, during one and half year of the project, together with de-worming and spray of acaricides (twice).
- ❖ Regular payments of Rs.500/- as a token money/incentive to calf owner/farmers was paid from February/March, 2010 to June, 2011 for feed and fodder.
- ❖ Research allowance @ Rs.10,000/- per month was given to one MSc(Hons) Student of SAU Tandojam, involved in this program alongwith Rs.20,000/- was also given to the research fellow at IBBt, UVAS Lahore for DNA assays towards his PhD Research work while Project Officer and Project Staff at Islamabad and LDF Office Tando Allah Yar were also paid accordingly (out of 10% allocation to LDF).
- ❖ Expenditure TA/DAs to technical and support staff as well as, scientists of UVAS, Lahore and SAU Tandojam were also met out of the total allocation.
- ❖ The 94 fully grown Kundi Bulls DNA tested, with Animal Health Coverage were ready for Natural Service by the end of December, 2012 but the project could not be continued due to stoppage of release of fund in June-2011.

DISCUSSION

Our study was in the right direction and a positive approach for Body Growth using Body Weight (BWt) of three parameters of measurements comprising BL, HL, HG. Our results are in agreement with Tozser *et.al (2000)*, in finding the relationship of body measurements and conformation traits in charolies weaned bull calves. Theva Manoharan *et.al (2001)* who worked on environmental factors affecting various body measurement of swamp buffalo calves, Karima *et.al (1993)* working on body measurement of 463 young Egyptian buffalo bulls, Pawan Singh *et.al (2010)* who worked on age and body weight in 437 male Murrah Buffalo Bulls of age 1-7 years, Abdel Hadi and Bakiker (2009) who worked on the production of calves on Live Weight using

live body measurement on 247 Sudanese indigenous Baggara Bulls, M. Younis *et.al (2003)* who worked on the effect of age and season on the Body Weight of Nili Ravi Bulls of Young (3-4 years), Adutls (5-8 years) and Old (12-15 years) and WMCB weera Singh *et.al (2009)* who conducted work on 100 cross bred buffaloes in predicting Body Weight through Body Measurement, under field condition.

Similar work is available by the research during the years 1972, 1968, 1983 and 1984 but only recent work is referred on these lines. We also used weighting Balances to confirm the body measurements based body weight which most of the above mentioned workers have done in their studies. Our work is also in agreement with the following workers how selected the criteria of Scrotal measurement/scrotal circumference with body growth and age viz. Tozser *et.al (2000)*, Pant H.C *et.al (2003)*, T.A Bongosa *et.al (1984)*, N. Ahmad *et.al (1989)*, M. Younis *et.al (1984)*, Yaseen and Mehmoda (1972), Mashoma *et.al (2010)*.

While going through the individual registered calf data (collected twice-a-month), as well as group date of Elite, A+, A, B+ and B categories, showed a steady but consistent positive growth in size, the body measurement (B.Wt. HWs, Body Length, HG) and scrotal development. DNA based production of Superior Bulls of Kundi Breeds of Buffaloes was taken up for the first time, although based on a nicely developed project proposal on ALP format of PARC for a period of three (03) years but could not be continued due to devolution of various Ministries and funding constraints.

Breed improvement program using the 94 bulls produced in the project No.AS-137 can be launched for improvement in the milk and meat production towards producing potential kundi buffaloes and bulls in Sindh the Country in general and conservation of these precious breeding animals in South Asia, in particular.

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farmers participated. There was marked difference before and after these trainings in the Animal Health & Production Practices in the sheds of the registered calves, as well as their herds.

- All formal Six Monthly Reports, Annual Reports and Reports of Farmers Trainings including the Proceedings of the Seminar were documented on the requisite format and copies sent to PARC-ALP Authorities, DG L& DD Department. Sindh, SAU Tandojam and UVAS Lahore including SARC-Karachi and elsewhere.
- In addition to Formal Agreements with farmers (on stamp paper) the Pamphlets in Sindhi Language, the Training Manual used in Training Program, (Animal health and Production Workers Training Manual) earlier written by Muhammad Hafeez (2006) in Urdu (ISBN-Registered) was got translated Dr. Javed Ali Gadahi, (2010) and one copy each was distributed to registered farmers, at the time of two trainings.
- Hundred percent (100%) Animal Health Coverage was provided to registered male calves including their bull others, as well as Herd Health Program on the Deras, of farmers. The Herd was from 4-5 animals (the maximum number of a herd). The animal health care including vaccination of buffalo calves with four bacterial (HSV, BQV, ETV and ASV) and one Viral (FMD) Vaccine, twice, during one and half year of the project, together with de-worming and spray of acaricides (twice).
- Regular payments of Rs.500/- as a token money/incentive to calf owner/farmers was paid from February/March, 2010 to June, 2011 for feed and fodder.
- Research allowance @ Rs.10,000/- per month was given to one MSc(Hons) Student of SAU Tandojam, involved in this program alongwith Rs.20,000/- was also given to the research fellow at IBBt, UVAS Lahore for DNA assays towards his PhD Research work while Project Officer and Project Staff at Islamabad and LDF Office Tando Allah Yar were also paid accordingly (out of 10% allocation to LDF).
- Expenditure TA/DAs to technical and support staff as well as, scientists of UVAS, Lahore and SAU Tandojam were also met out of the total allocation.
- The 94 fully grown Kundi Bulls DNA tested, with Animal Health Coverage were ready for Natural Service by the end of December, 2012 but the project could not be continued due to stoppage of release of fund in June-2011.

DISCUSSION

Our study was in the right direction and a positive approach for Body Growth using Body Weight (BWt) of three parameters of measurements comprising BL, HL, HG. Our results are in agreement with Tozser *et.al (2000)*, in finding the relationship of body measurements and conformation traits in charolies weaned bull calves. Theva Manoharan *et.al (2001)* who worked on environmental factors affecting various body measurement of swamp buffalo calves, Karima *et.al (1993)* working on body measurement of 463 young Egyptian buffalo bulls, Pawan Singh *et.al (2010)* who worked on age and body weight in 437 male Murrah Buffalo Bulls of age 1-7 years, Abdel Hadi and Bakiker (2009) who worked on the production of calves on Live Weight using

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