Article
Factor shares analysis of livestock products in selected areas of Bangladesh

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Abstract: A study was undertaken to assess the contribution of different inputs such as feed, labor veterinary services and depreciation cost etc. to the development of livestock sector including poultry in the study area. The factor shares of livestock products was estimated based on the primary data for the periods of April to July, 2012.The factor shares of livestock production suggested that current factors (Feed, hired labor, veterinary services and other inputs) and family labor was the major component in the livestock production. Traditional milk producing farmers in Gazipur were not benefited from their farming due to residual share was negative (-11.15%). For commercial milk production, on an average the largest share current factors (60.54 percent) followed by residual (28.1 percent), family labor (6.63 percent), depreciation (4.74 percent), respectively and residual share was positive. Production of beef cattle on an average the largest share current factors (74.26 percent) followed by family labor (21.73 percent), depreciation (46.425 percent), respectively and residual share was negative (-2.41 percent). Production of egg by traditional management was found profitable enterprise in small and large categories of farms. As a result, residual share was positive (1.54 percent and 12.01 percent) for small and large farms. In case of commercial poultry production on an average the largest share current inputs (74.29 percent), residual ((19.64 percent), followed by family labor (5.64 percent) and depreciation (0.44 percent) respectively. In addition, on an average broiler production the largest share current inputs (84.18 percent), residual (12.53 percent), followed by family labor (2.68 percent) and depreciation (0.62 percent) respectively.

Keywords: livestock products; poultry; dairy and residual

1. Introduction
Livestock play a vital role in rural economy. The combination of livestock and crop farming enables complementarily through productive utilization of farm by-products and conservation of soil fertility, thus increasing rural farm income. Apart from providing food products like milk, egg and meat, livestock sector generates productive employment and valuable supplementary income to the vast majority of rural households, majority of who are small and marginal farmers and landless laborers. Bangladesh is a country of serious malnutrition where about 44 per cent of the population lives in poverty, measured by CBN method (BBS, 2007). Protein deficiency has been taken as the major contributory in malnutrition. The per capita consumption of animal protein in Bangladesh is only 11.8 gm per day (BBS, 2001) whereas the standard requirement of 36 gm was recommended by UNO. According to the report of the DLS (2006) and BBS (HIES, 2010) average per capita availability of milk, meat is 18.6 gm, 33.7 gm per day and egg is 44 (no.) per year whereas per capita

requirement of milk, meat is 250 gm,120 gm per day and egg is 104 (no.) per year. The livestock sector is considered an important to reduce poverty and malnutrition as well as unemployment problems of Bangladesh. Depending upon land and climatic suitability, a farmer can produce and earn considerably more from livestock than crops alone from a unit of land, if production, processing and the marketing of livestock and livestock products are properly organized. Several studies revealed that rearing of livestock, especially dairy cows and poultry is a profitable enterprise for the farmer (Rahman 1993; Alam 1995; Kabir 1995; Ashrafuzzaman and Rahman 1995; and Paul 1995).

Livestock rearing is considered as a highly viable sector for generation of employment and income for the landless, unemployed youths and destitute women. Livestock farming, unlike crops, is not seasonal. People in this country raise livestock mainly with a view to getting meat, milk and egg, etc. to fulfill their day-to-day consumption and some raise only commercial purpose. Income from sale proceeds also helps them to satisfy their various financial needs. The folk size, structure and characteristics of rural poultry were very similar all over the world (Sonaiya, 2002) but their structure and management were so different from commercial livestock production systems in terms of input requirements. In this context, it is essential to examine the answers relating to questions concerning livestock productivity growth: How much has productivity growth contributed to the growth of total output? What have been the sources of productivity growth? What are the shares of different inputs to this growth? What are the different output shares in this growth? The estimation of the share of different inputs like feed, labor and veterinary services in the total inputs cost would help to allocate rationally these scarce resources by formulating suitable farm plans. With the above objectives, the present study was carried out to find out the share of different inputs like feed, labor, depreciation and veterinary services in the total inputs cost in the livestock sector.

2. Materials and Methods
The study utilized primary data. The primary data were obtained from the sample livestock farmers through personal interview with the help of pre-tested and structured schedules. Data were collected from livestock producers during April to July, 2012. Two livestock producing districts were selected purposively, namely, Sirajgonj and Gazipur and two Upazilas from each district were selected on the basis of concentration of livestock production. The selected Upazilas were Sreepur and Joydevpur in Gazipur district, Shahajadpur and Ullahpara in Sirajgonj district. Sampling size was determined at 95% confidence level and 10% sampling error. In order to reach the maximum sampling volume p and q ratios were obtained (Newbold, 1994). Eighty (Forty traditional and forty commercial) poultry farmers, eighty (Forty traditional and forty commercial) dairy farmers, forty beef cattle farmers and forty broiler farmers were selected following random sampling technique from each of the two districts applying without replacement concept.

2.1. Method of measuring factor share analysis
Factor share analysis is a widely used economic tool for measuring the distribution of farming accruing to different productive factors. Factor share is defined as the ratio of costs of factor inputs used in the production process to the total value of output (Shahid, 1982; Kikuchi, 1991).
In case of production of livestock products, for instance,
Factor share of ith inputs was:

$$= \frac{P_i X_i}{P_1 Q_1 + P_2 Q_2} = \frac{Cost}{GR (Gross\,Re\,venue)}$$

Where,
Pi = price of ith inputs
Xi = quantity of ith inputs
P_1 = price of output
Q_2 = quantity of output

3. Results and Discussion
3.1. Share of factors in the production of milk under traditional management
As can be seen from the Table 1 in Gazipur traditional milk producing farmer, the largest share 62.19% accrued to the current factors followed by family labor (43.60%), depreciation (5.35%), respectively. Traditional milk producing farmers in Gazipur were not benefited from their farming due to residual share was negative (-11.15%). In addition, farmers in Siragonj, the largest share 55.62% accrued to the current factors followed by

family labor (33.27%), residual (total value of output- current inputs, family labor and depreciation) (7.13%) and depreciation (3.96%), respectively. However, on an average the largest share current factors (58.91%) followed by family labor (38.44%) and depreciation (4.66%), respectively and residual share was negative (-2.01).

Table 1. Share of factors in the production of milk by traditional farming.

Factors	Value (Tk/cow/year)			Factor share (%)		
	Gazipur	**Sirajgonj**	**All**	**Gazipur**	**Sirajgonj**	**All**
Current factors (a + b + c + d)	29765	30820	30293	62.19	55.62	58.91
a) Feed	21684	22549	22116	45.30	40.69	42.99
b) Hired labor	7693	7554	7623	16.07	13.63	14.85
c) Veterinary services	192	480	336	0.401	0.87	0.636
d) Other inputs	197	237	217	0.412	0.43	0.421
Family labor	20870	18434	19652	43.60	33.27	38.44
Depreciation	2561	2197	2379	5.35	3.96	4.66
Residual	-5338	3953	-69.46	-11.15	7.13	-2.01
Total value of output	47858	55404	51631	100	100	100

*Other input includes costs of artificial insemination, miscellaneous and interest on operating capital.

3.2. Share of factors in the production of milk under commercial management

As shown in Table 2 in Gazipur commercial milk producing farmer , the largest share 64.48 percent accrued to the current factors in total cost of producing milk followed by residual (total value of output- current inputs, family labor and depreciation) (24.58 percent), family labor (6.77 percent), depreciation (4.18 percent),respectively. Commercial milk producing farmers in Gazipur were benefited from their farming due to residual share was positive.

In addition, farmers in Siragonj, the largest share 56.59 percent accrued to the current factors followed by residual (total value of output- current inputs, family labor and depreciation) (31.62 percent), family labor (6.49 percent), depreciation (5.29 percent) , respectively. However, on an average the largest share current factors (60.54 percent) followed by residual (28.1 percent), family labor (6.63 percent) and depreciation (4.74 percent), respectively and residual share was positive.

Table 2. Share of factors in the production of milk by commercial farming.

Factors	Value (Tk/cow/year)			Factor share (%)		
	Gazipur	**Sirajgonj**	**All**	**Gazipur**	**Sirajgonj**	**All**
Current factors (a + b + c + d)	66310	53846	60078	64.48	56.59	60.54
a) Feed	45342	41516	43429	44.09	43.63	43.86
b) Hired labor	18338	9934	14136	17.83	10.44	14.14
c) Veterinary services	1968	2180	2074	1.92	2.29	2.11
d) other inputs	663	215	439	0.64	0.23	0.44
Family labor	6958	6176	6567	6.77	6.49	6.63
Depreciation	4298	5043	4670	4.18	5.29	4.74
Residual	25275	30086	27681	24.58	31.62	28.1
Total value of output	102841	95151	98996	100	100	100

*Other inputs includes costs of artificial insemination, miscellaneous and interest on operating capital.
 *1 man-day = 8 hours (for male) = 12 hours (for female) = 16 hours (for children)

3.3. Share of factors in the beef cattle production

Production of beef cattle in Gazipur, the largest share 68.57 percent accrued to the current factors followed by family labor (23.75 percent), depreciation (6.33 percent), respectively and residual was found positive 1.35 percent (Table 3).

On the other hand, farmers in Sirajgonj, the largest share 79.95 percent accrued to the current factors followed by family labor (19.70 percent), and depreciation (6.52 percent), respectively.

However, on an average the largest share current factors (74.26 percent) followed by family labor (21.73 percent) and depreciation (46.425 percent), respectively and residual share was negative (-2.41 percent).

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Table 3. Share of factors in the beef cattle production in different study areas.

Factors	Value (Tk/cow/year)			Factor share (%)		
	Gazipur	Sirajgong	All	Gazipur	Sirajgong	All
Current factors (a + b + c + d)	22719	23889	23304	68.57	79.95	74.26
a) Feed	18246	20029	19138	55.07	67.03	61.05
b) Hired labor	4068	3012	3540	12.77	10.08	11.43
c) Veterinary services	284	750	517	0.85	2.51	1.68
d) other inputs	122	99	110	0.37	0.33	0.35
Family labor	7870	5888	6879	23.75	19.70	21.73
Depreciation	2097	1949	2021	6.33	6.52	6.425
Residual	445	-1844	-699	1.35	-6.17	-2.41
Total value of output	33132	29882	31507	100	100	100

*Other input includes costs of miscellaneous and interest on operating capital.

3.4. Share of factors in the production of egg under backyard management

Production of egg in the study area by traditional management was found profitable enterprise in small and large categories of farms. As a result, residual share was positive (1.54 percent and 12.01 percent) for small and large farms (Table 4). In case of small farm high share of current factors (57.12 percent) in total cost of producing egg and lower share of family labor (39.48 percent). In the study areas medium farms were break-even position and large farms were performed profitable business for egg production by traditional management.

It was divulged from the table 4 in large farm, the largest share current factor (72.96 percent) followed by residual (total value of output- current inputs, family labor and depreciation) (12.01 percent), family labor (10.43 percent) and depreciation (4.59 percent), respectively.

Table 4. Share of factors in the production of egg by farm category under traditional   management.

Factors	Value (Tk/farm/year)			Factor share (%)		
	Small	Medium	Large	Small	Medium	Large
Current factors (a + b + c + d)	4451	9222	11280	57.12	76.72	72.96
a) Feed	3335	7513	9221	42.79	62.5	59.64
b) Hired labor	896	1456	1807	11.49	12.11	11.69
c) Veterinary services	156	163	166	1.99	1.36	1.07
d) other inputs	65.32	90.59	86.6	0.84	0.75	0.56
Family labor	3076	2493	1612	39.48	20.74	10.43
Depreciation	146	407	711	1.87	0.39	4.59
Residual	120	-102	1858	1.54	-0.85	12.01
Total value of output	7792	12020	15460	100	100	100

*Other inputs includes costs of feeding pot, miscellaneous and interest on operating capital.

3.5. Share of factors in the production of egg under commercial management

It appears from the Table 5, in Gazipur, the largest share current inputs (72.12 percent), residual (total value of output- current inputs, family labor and depreciation) (20.79 percent), followed by family labor (6.63 percent) and depreciation (0.47 percent) respectively.

On the contrary, in Sirajgonj, the largest share current inputs (76.45 percent), residual (total value of output-current inputs, family labor and depreciation) (18.49 percent), followed by family labor (4.65 percent) and depreciation (0.41 percent) respectively.

More ever, on an average the largest share current inputs (74.29 percent), residual (total value of output- current inputs, family labor and depreciation) (19.64 percent), followed by family labor (5.64 percent) and depreciation (0.44 percent) respectively.

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Table 5. Share of factors in the production of 500 eggs under commercial management.

Factors	Value (Tk/500 eggs)			Factor share (%)		
	Gazipur	Sirajgong	All	Gazipur	Sirajgong	All
Current factors (a + b + c + d + e)	898410	876225	887318	72.12	76.45	74.29
a) Mixed Feed	745500	742875	744188	59.84	64.82	62.33
b) Chicks	20000	21000	20500	1.61	1.83	1.72
c) Salary and wages	97145	72000	84573	7.79	6.28	7.04
d) Veterinary cares	25664	28300	26982	2.06	2.47	2.27
e) other inputs	10100	12050	11075	0.81	1.05	0.93
Family labor	82500	53301	67900.5	6.63	4.65	5.64
Depreciation	5823	4661	5242	0.47	0.41	0.44
Residual	259025	211922	235474	20.79	18.49	19.64
Total value of output	1245757	1146110	1195934	100	100	100

*Other inputs includes costs of feeding pot, litter, electric bills, miscellaneous and interest on operating capital.

3.6. Share of factors in the production of broiler

As was observed from the Table 6 in Gazipur, the largest share current inputs (77.35 percent), residual (total value of output- current inputs, family labor and depreciation) (19.14 percent), followed by family labor (2.82 percent) and depreciation (0.68 percent) respectively.

On the contrary, in Sirajgonj, the largest share current inputs (91 percent), residual (total value of output- current inputs, family labor and depreciation) (5.91 percent), followed by family labor (2.54 percent) and depreciation (0.55 percent) respectively.

.In addition, on an average the largest share current inputs (84.18 percent), residual (total value of output-current inputs, family labor and depreciation) (12.53 percent), followed by family labor (2.68 percent) and depreciation (0.62 percent) respectively.

Table 6. Share of factors in the production of 500 broilers in different study areas.

Factors	Value (Tk/500 birds)			Factor share (%)		
	Gazipur	Sirajgonj	All	Gazipur	Sirajgonj	All
Current factors (a + b + c + d + e)	73663	82880	79021	77.35	91.0	84.18
a) Mixed Feed	49440	59895	54667	51.91	65.76	58.84
b) Chicks	16000	17500	16750	16.80	19.22	18.01
c) Salary and wages	2400	1450	1925	2.52	1.59	2.06
d) Veterinary cares	3798	3912	3855	3.99	4.29	4.14
e) other inputs	2025	1623	1824	2.12	1.78	1.95
Family labor	2688	2311	2499	2.82	2.54	2.68
Depreciation	655	500	577	0.68	0.55	0.62
Residual	18223	5385	11055	19.14	5.91	12.53
Total value of output	95229	91076	93152	100	100	100

*Other inputs includes costs of feeding pot, litter, electric bills, miscellaneous and interest on operating capital.

4. Conclusions

To meet out the growing demand for livestock products, various technological interventions were introduced in the livestock sector of the Country which resulted in improvements in production, productivity and per capita availability of livestock products.

Conflict of interest

None to declare.

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