



Feeding practices and compositional verification of the constituents of growth promoters for cattle fattening in Bangladesh

MS Khan¹, MK Bashar*¹, MA Akbar², KS Huque²

¹Animal Production Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka 1341;

²Department of Animal Nutrition, Bangladesh Agricultural University, Mymensingh 2202, Bangladesh

Abstract

A survey was carried out among 50 cattle fattening farmers covering 11 Upazillas' under 7 districts of Bangladesh and a total of 14 growth promoters (GP) from 9 pharmaceutical companies engaged with marketing GP were collected for the compositional verification of the constituents from their specification. For cattle fattening, about 78% respondents used their own labors, 16% dependent on hired labor and only 6% used both the sources. Majority of the farmers (48%) used a diet of straw, green grass and concentrate, 40% of them used straw and concentrate and the rest 4.0% used green grass and concentrate. Most of the (60%) farmers used only straw for fattening cattle and rest of them (40%) used urea-molasses-straw (UMS) and urea treated straw (UTS), of them 28% used UMS and 12% used UTS. In all the locations, 90% farmers used GP for fattening their cattle, of them 78% used vitamin-mineral premixes, 8% used vitamin-mineral and enzyme premixes and the rest 4% used antibiotic, vitamin-mineral and enzyme premixes. Only 10% farmers don't have any experience to use GP for cattle fattening. The presence of Ca and P in GP were found all most similar in all the companies but in some cases the values were found higher or lower than the specification. Availability of amino acids, Methionene and lysine were found very close to their product specification but one company failed to maintain their product quality according to their specification. Farmers are still using traditional feeding system but they are concerned to use GP for fattening cattle. Although, companies have maintained product quality but quality control of GP marketed and used by the farmers should be strictly followed on routine basis.

Key words: Cattle fattening, feeding practices, growth promoter

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Introduction

Livestock plays potential role in the national economy being a vital component of agriculture. The contribution of livestock to the country's gross domestic product (GDP) is 2.46% and to agriculture is 17.15%, and the earning of foreign exchange from hides and skins is 4.31 percent (BER 2008). The growth of livestock production is highest among all other sub-sectors of agriculture in Bangladesh (BER 2007), but the production and consumption of livestock products is still much lower in comparison to other developed countries. The consumption pattern of meat of 180 countries in the world, the position of Bangladesh is 18th amounting only 7.13 kg/capita/year compared to USA of 124 kg and the global average of 38 kg (BBS 2009). The quantitative production of meat in Bangladesh in 2006-2007 is 1.04 million tons against the total requirement of 6.30 million tons (BBS 2009).

The projected production of meat is 2.87 million tons in 2015, but the total requirements will be 6.86 million tons, indicated a huge gap exists between production and the total requirement both in 2005 (82.4%) and 2015 (58.2%). Therefore, beef production is needed to reduce this huge gap between requirement and availability. However, beef production in Bangladesh is largely dependent on traditional system of cattle fattening with very low input support. According to BBS 2009, the requirement of animal protein per head per day is 36 g whereas the availability is only 14.2 g. Moreover, being a Muslim country, there is a seasonal demand of beef cattle during Eid-ul-Azah.

Rapidly growing demand of meat in the urban and peri urban areas has intensified the practice of cattle fattening program by the farmers in Bangladesh. Some pharmaceutical companies have launched some products in different brand

*Corresponding Author: kbashar20@yahoo.com

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names targeting cattle fattening farm, which are usually treated as growth promoters (GP). Market and field observations revealed that these are vitamin mineral premixes, mineral premixes, enzymes and antibiotics. Some of them may have boosting effects on animal production; some of them may have deleterious residual effects on human health and a potential threat to the emerging cattle fattening enterprise. Since 2001, EU have already banned the use of growth promoter in cattle fattening industry.

The information on feed additives and growth promoter, used for cattle fattening along with their quality, efficacy and chemical composition compared to the product specifications are very scanty in Bangladesh. Therefore, the present study was to investigate feeding practices of cattle fattening and to determine the chemical composition of the GP to identify the deviations from product specification.

Materials and Methods

A purposive survey was carried out before Eid-ul-Azha among 50 cattle fattening farmers covering 11 Upazillas' under 7 districts of Bangladesh (Table 1). The data were collected from each farmer through direct interviewing method and observation of facts from their household. In addition, a total of 9 pharmaceutical companies, who imported and manufactured GP (antibiotics, steroids, vitamin minerals premixes, probiotics and minerals premix) were selected basis on of the information from Department of Livestock Services (DLS) to authenticate compositional differences from the product specification.

Table 1. Name of the Districts and number of respondent's upazilla

District	Upazilla	Respondents per Upazilla	Total Respondents
Pabna	Sadar	7	10
	Bera	3	
Jaypurhat	Akkulpur	9	9
Dinajpur	Hakimpur	4	14
	Sadar	2	
	Chirirbandar	3	
	Birganj	5	
Jhenaidah	Sadar	6	6
Rajshahi	Dugrapur	3	3
Satkhira	Sadar	3	3
Jamalpur	Madargonj	5	5
Total= 7	11	50	50

In addition, 14 GP samples were collected from 9 pharmaceutical companies and farmers (Table 2). The chemical analysis of the samples was performed at Animal Nutrition Section of DLS and Bangladesh Livestock Research Institute. The content of Ca and P of were determined by titration method according to the procedure of AOAC (2000). Amino acids, lysine and methionine were determined by pre-column derivatization method using orthophthaldialde-hyde (OPA) and beta-mercaptoethanol followed by high performance liquid chromatography as described by Kerlinger (1973). Fluorescence detection was used for the assay of OPA derivatives of amino acids with the detection wavelength set at Ex 340 nm and Em 455 nm.

Table 2. List of the companies where growth promoters were collected

Sl.	Name of Companies	Name of the growth promoter
01	ACI Ltd	Acivit-DB, Acitol-B12, Calfostonic
02	Square Pharmaceuticals Ltd	DB Vitamin, Buphos-vet, B50-vet, Calplex, etc
03	Jayson agrovet Ltd	Dibison, Cattle care
04	The ACME laboratories Ltd	Vitamix DB super, V-plex Vet Plus, A- Sol, Anora
05	Popular Pharmaceuticals Ltd	Megalac, Megamos, Enzyme, Aminovit Plus, Megasol
06	Novartis BD Ltd	Megavit-DB, Sancal Vet oral, Milk Boost
07	Techno Drugs Ltd	Biomix-DB, Metafos, Bional, TechnomycinPrednivet
08	Roras Agro Pharma	RominZyme, Romin AD3E vet, etc Gimix-DB, Gicalfos

Figure in the parentheses indicate the number of companies which marketed the growth promoter for cattle fattening in Bangladesh

After the completion of data collection, all interview schedules were complied, coded, tabulated and analyzed according to the objectives of the study. The responses to the question in the interview schedule were transferred to MS-Excel spread sheet of the computer. Statistical analysis was done using a computer package SPSS program.

Results and Discussion

The source of labor in fattening cattle and feeding practices in the study areas are mentioned in Table 3. About 78% respondents used their own

labors for cattle fattening, 16% of them depend on hired labor and the rest 6% used both the sources. As regards to feeding practice, rice straw was the major roughage source for fattening cattle. In the study areas, most of the farmers (48%) were using a diet of straw, green grass and concentrate, 40% of them used straw and concentrate, and the rest 4% of them used green grass and concentrate. Tareque (2001) reported that 69% of the total roughage was dry and of them 87% was rice straw. The contribution of green roughage to the total available dry matter was 27%.

Table 3. Source of labor and feeding practices of cattle fattening in the study areas

Districts	Source of Labor			Feeding practices of Cattle			
	Own	Hired	Own+Hired	SR+GG	SR+CN	GG+CN	SR+GG+CN
Pabna (10)	8	2	-	-	4	1	5
Jaypurhat (09)	9	-	-	-	8	-	1
Dinajpur (14)	7	5	2	3	3	-	1
Jhenaidah (06)	4	1	1	1	-	1	4
Rajshahi (03)	3	-	-	-	1	-	2
Satkhira (03)	3	-	-	-	3	-	-
Jamalpur (05)	5	-	-	-	1	-	4
Total=50	39	8	3	4	20	2	24
Mean	5.5	1.1	0.4	0.5	2.8	0.2	3.4
Percentage	78	16	6	8	40	4	48

Figure in the parentheses indicate the number of respondents; SR, straw; GG, green grass; CN, concentration

The feeding practices of the cattle fattening farmers is mentioned in Table 4. About 40% of the farmers used urea-molasses straw (UMS) and urea treated straw (UTS), and out of them 28% used the former and 12% used the later. The rest 60% of the respondents used dry straw for their cattle (Table 4). The use of UMS was comparatively higher than the use of in the study areas. Majority of the farmers had no idea on feeding UMS or UTS. Treatment of straw with or without urea and/or molasses is important for getting better growth of ruminant animals as rice straw alone cannot support nutrient requirement of livestock due to its low intake, low digestibility, and due to deficiency of available protein and micronutrients (Akbar 1992). Feeding UMS developed by Bangladesh Livestock Research Institute (BLRI) can be a common practice for fattening cattle.

Table 4. Type of straw fed to the animals by the farmers in the study areas

Districts	Feeding treated straw		Type of straw fed	
	Yes	No	UMS	UTS
Pabna (10)	-	10	-	-
Jaypurhat (09)	7	2	7	-
Dinajpur (14)	8	6	6	2
Jhenaidah (06)	1	5	1	-
Rajshahi (03)	1	2	-	1
Satkhira (03)	3	-	-	3
Jamalpur (05)	-	5	-	-
Total=50	20	30	14	6
Mean	2.8	4.28	2	0.8
Percentage	40	60	28	12

Figure in the parentheses indicate the number of respondents; UMS, urea molasses straw; UTS, urea treated straw

The list of companies and their product name are mentioned in Table 5. The result of showed that 90% of the farmers used GP in fattening cattle and of them 78% used vitamin-mineral premixes, 8% used vitamin-mineral and enzyme premixes and the rest 4% farmers used antibiotic, vitamin-mineral and enzyme premixes. Rick and Mader (1984) stated that there is no doubt that feed additives have made a great contribution to improving the performance and general health of livestock. They also stated that one of the best methods to reduce feed costs is to use feed additives. Minerals and vitamins are needed as a very small percentage of dietary nutrients, they are very important in beef cattle nutritional programs for proper animal function, such as bone development, immune function, muscle contractions and nervous system function (Parish and Rhinehart 2008).

Table 5. Growth promoter/feed additives used by the farmers in different locations

Districts and Respondents	Use of GP		Type of growth promoters		
	Yes	No	VMP	VME	AVME
Pabna (10)	6	4	3	1	2
Jaypurhat (09)	9	-	9	-	-
Dinajpur (14)	13	1	13	-	-
Jhenaidah (06)	6	-	4	2	-
Rajshahi (03)	3	-	3	-	-
Satkhira (03)	3	-	3	-	-
Jamalpur (05)	5	-	4	1	-
Total=50	45	5	39	4	2
Mean	6.4	0.7	5.5	0.5	0.2
Percentage	90	10	78	8	4

GP, growth promoter; VMP, Vit-Min Premix; VME, Vit-Min and enzyme; AVME, Antibiotics, Vit-Min and enzyme

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Table 6. Comparison of the Ca and P between companies specification and analytical value

Company Name	Product name	Name of ingredients	Company value (%)	Analytical Value (%)
Novartis BD Ltd	Megavit DB	Ca	23.3	30.84
		P	5.4	5.37
	Milk Boost	Ca	2.55	2.54
		P	1.27	1.27
Square Pharmaceuticals Ltd	DB vitamin	Ca	44.4	36.77
		Ca	34	39.36
	Calplex	P	17	12.36
The ACME Lab. Ltd	Vitamin DB super	Ca	26	34.13
		P	6.5	7.5
ACI Ltd	Acivit DB	Ca Carbonate	1000 g	36.92
		P	6.5	8.09
	Calfostonic	Capantothenate	500mg/1000g	40.6
Jayson Agrovet Ltd	Cattle care	Ca	30	40.6
		P	9	Nil
Popular Pharmaceuticals Ltd	Megalac	Other	6-8	0.73
Pharmavet Co. Ltd	Pharmavit DB	Ca	Not mention	8-10
		P	Not mention	17.87
Roras Agro Pharma	Calmin Plus	Ca	1800mg	36.85
		P	850mg	8.98

Feed conversion efficiency was improved in bull calves by using Metafos (Minerals derivatives) and Biomix-DB (Vitamin-mineral premix) reported by Mukta (2004). The pharmaceutical preparation of vitamins and minerals either in the form of injectable solution or bolus have considerable effect on growth performances (Amanullah et al. 2008).

The compositional variations of the Ca and P of the GP from different companies are Comparison between companies specification and analytical value is presented in Table 6 and of the Methionen and Lysine are presented in Table 7. It was found from Table 6 and 7 that all the manufacture specifications in relation to ca, P, L-lysine, DL- Methionine, content were almost similar between analytical values and product specification. However, analytical values were found slightly lower particularly for L-lysine and DL- Methionine than that of manufacturer specification. On the other hand, the values of Ca and P sometimes higher or lower than the manufacturer specifications.

Table 7. Concentration of Methionene and Lysine.

Name of company	Products name	Name of ingredients	Company value	Analytic values
Techno Drugs	Bionel	Methionene BP	5.0 mg/ml	4.5 mg/ml
ACI	Acivit- DB	Methionene	10g/1000g	8.8g/1000g
		Lysine	2.5g/1000g	2.4g/1000g
	Calfostonic	Methionene	10g/1000g	8.4g/1000g
		Lysine	2.5g/1000g	2.4g/1000g
Square	DB vitamin	Methionene	10g/1000g	8.7g/1000g
		Lysine	2.5g/1000g	2.4g/1000g
Jason	Dibison	Methionene	10g/1000g	8.6g/1000g
		Lysine	2.5g/1000g	2.3g/1000g
Popular	Aminovit plus	Methionene USP	0.525g/100g	0.42g/100g
Novartis	Megavit DB	Methionene	2.24g/kg	0.78g/kg
		Lysine	1.16g/kg	0.12g/kg

Therefore, the results of the nutrient analyses from the laboratory indicated that in some cases the manufacturers could not maintain the nutrient level as they specified in their products.

Conclusion

It may be concluded that majority of the farmers are still using traditional feeding system for fattening cattle but they are very much concern to use GP. At most all the companies maintain their product quality except very few. Quality control of GP marketed and used by the farmers should be strictly followed, and efficacy of different feed additives on growth performances of cattle required to be investigated on routine basis.

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