

Annual Consumption of Veterinary Medicines and Feed Supplements in Nepal

Abstract

A survey was conducted by making a visit to each importer of foreign companies and marketing offices of Nepalese companies to find out their annual sales of veterinary medicines and feed supplements in two consecutive fiscal years (2057/58 and 2058/59). The total quantity of antibiotics, anthelmintics, anticoccidials, sulfonamides, nitrofurans were calculated in terms of active ingredients and the vitamins, minerals, amino acids and probiotics were calculated in the form of powder or liquid that they were available in the market. The total quantity of each category is multiplied by their respective retail price and the total amount of money invested was found out.

The findings of this study showed that total among of veterinary medicines and feed supplements worth NRs 492million is consumed annually in Nepal. Out of this, drugs worth NRs 81.74 million (19.89%) are produced, whereas drugs worth NRs410.92 million (80.1%) are imported inside Nepal. The percentage shared by the categories of the drugs - vitamins, minerals, amino acids and probiotics is 38.24%, followed by Ayurvedic preparations 15.05%, anthelmintics 14.36%, antibiotics 13.15%, anticoccidials 5.2%, sulphonamides 4.09%, performance enhancers 2.30%, toxin binders 1.98%, nitrofurans 1.54%, liver tonics 2.32% and miscellaneous preparations 2.80%.

Nepal seems to be a huge consumer of veterinary medicines and feed supplements, but the return from the use of these preparations is cost effective or not, it should be found out by undertaking further study.

1. Introduction:

Livestock is the integral part of Nepalese farming system, which shares 18% of the national gross domestic product (APP- 1995). The Nepalese livestock industry in the process of great transformation from its subsistence type to the commercialized one, with the increased demand of animal products. To achieve optimum level of production, a huge sum of money is being invested in medicines and feed supplements, apart from feeding and management. Along with the practice of rearing exotic breeds and varieties of animals and birds, the consumption of medicines and feed supplements is increasing, even tremendously. So manufacturing of Veterinary Medicines and feed supplements is itself getting status of an industry.

Until few decades back, the use of veterinary pharmaceuticals was very limited or nil at all. There is no any authentic information suggesting from when chemotherapeutic agents were used for the treatment of animals in Nepal, but Nepalese farmers have been using self made herbal preparations since the time immemorial, which is even in existence in the rural communities because of their local availability and low cost. Before 1995 B. S., treatment of clinically sick animals was confined to Kathmandu valley only, along with Homeopathy and traditional systems (*Singh, 1984*). Modern method of Livestock treatment is believed to be started around mid 1996 B. S. and **the first Veterinary Dispensary** was established in Kathmandu. (*Annual Progress Report, F/Y 045/046, Central Animal Health Center, 2046*).

It was in the year 2020/2021 B.S. when the first medicinal preparation was used in poultry production and that was vitamin A, a human medicinal preparation marketed by *Glaxo* Company. Later on, *Rovimix* got introduced in Nepal which was the first veterinary feed supplement marketed in Nepal. After the establishment of Government Livestock Service Centers, the specific preparations for animal use had been produced. To begin with, preparations like Pulv. Catachu, Pulv. Chiratra, Sulfur, Pulv. Ginger, Pulv. Nuxvomica were made available from these offices directly to a limited number of farmers. By this time some Indian companies were producing medicines, which later on get gradually introduced in Nepal.

The first company to produce feed supplement in Nepal was Rajeev Feeds, Kathmandu, which had started its production in the year 2040 B.S. Herbal Veterinary preparations was first manufactured inside the country by "*Pashupati Vet Herbs*" but the history of veterinary chemotherapeutic agents manufacturing is not so old. The first Nepalese company to produce veterinary medicines was the "*Nepal Pharmaceuticals lab, Birgunj*", which launched its products in the year 2051 B.S.

At present the scenario is quite different. A significant amount of Veterinary Medicines and Feed Supplements are produced within the country. Besides, a huge amount is being imported. There are about 13 Nepalese companies, some 50 Indian companies and a few multinational companies marketing their products in Nepal.

2. Problem To Be Addressed & Justification:

The Indian and multinational companies are marketing a huge amount of Veterinary medicines and feed supplements in Nepal. Every year foreign new companies are launching

their products to Nepal, because the demand for these preparations is ever increasing. On the contrary, Nepalese companies are still in a primitive stage and unable to compete with the foreign companies. Meanwhile, instead of expanding the range and amount of production, these companies are hardly able to sustain. New entrepreneurs, who want to invest in Veterinary pharmaceutical industry, are in a state of dilemma. They don't have the idea of the market condition of Veterinary Pharmaceuticals i.e. the total amount as well as the demand of specific category of drug, because of the lack of well-documented information of the Veterinary Pharmaceuticals products produced inside Nepal and imported to Nepal. This survey is thus conducted to find out the production of Veterinary Pharmaceuticals inside the country and import from foreign countries.

Similarly, the super distributors of India and Multinational companies are importing the drugs based only upon a rough estimate of the demand of each class of drug. So, in many occasions, a class of drug imported becomes insufficient and the other class remains stocked, which incurs a great loss to them. This study will also suggest these super distributors to estimate the quantity of each class of drug to be imported for a specified time period.

In recent years, Nepal has emerged as an excellent market for Veterinary Medicines and feed supplements due to the commercialization of livestock and poultry industry. There are only a few companies inside the country producing these products and the quantity produced is not sufficient to meet the demand of the country. So, a large amount of drug is being imported from India and third world countries. This survey is thus being carried out to find out the actual demand; production inside the country and import of Veterinary Medicines and feed supplements, specific classes of them and the amount of active principles within each class of drug, used in livestock and poultry industry.

This survey report will be very much useful to the government to formulate policies and strategies related to Veterinary Medicines and feed supplements, for the existing manufacturers to expand the quantity and range of products, and encourage the new entrepreneurs to invest in Veterinary Medicines and feed supplements manufacturing, and the ultimate beneficiaries will be the livestock and poultry industry.

3. Objectives:

- To find out the amounts of drugs used in livestock and poultry industry,
- To calculate the amount of money invested in Veterinary Medicines and feed supplements,
- To find out the amount of money going to foreign countries for importing these drugs,
- To estimate the amounts in proportion of the drugs produced inside Nepal and that is being imported,
- To find out the scope of manufacturing Veterinary Medicines and feed supplements in Nepal.

4. Methodology:

Data collection: A detail survey was conducted by making a visit to each super-distributor of foreign companies and marketing offices of Nepalese companies, which were located in

Bhairahawa, Nawalparasi, Narayanghat, Kathmandu, Bahaktapur, Birgunj and Biratnagar. Different type of questionnaires were prepared and distributed to the marketing executives of each companies (refer annex III & IV), which was filled up by them and returned back. The questionnaire format for Nepalese companies had queries about trade name and generic name of the product, quantity sold in the two consecutive fiscal years (i.e. 2056 /057 and 2057/058 BS.), whole sale price per unit and retail price per unit o of the product. Similarly, the questionnaire format for the foreign companies was asking the trade name and generic name of the product, its quantity sold in the fiscal year 2056/057 and 2057/058, wholesale price per unit and retail price per unit of the product.

Data Analysis: Based on the product information booklets and leaflets published by the manufacturing companies, the drugs were classified(BranderG.C.2001) under the categories; Antibiotics, Anthelmintics, Anti-diarrhoeals, Anti-inflammatory, Anti-histaminics, Antifungals, Antiprotozals, Anticoccidials, Analgesics, Antipyretics, Appetizers, Dis infectants, Diuretics, Expectorants, Enzymes, Electrolytes, Ectoparasiticidals, Infusions, Liverton ics, Minerals, Mineral mixtures , Nitro furans, Hormones, Sulphonamides, Vitamins, Multivitamins, Mineral and vitamin preparations, Toxin binders.

The active principles of each of the above categories are calculated in terms of quantity (Lit. or Kg). The active principles of category Antibiotics includes: Procaine penicillin G, Penicillin G sodium, Benzathine penicillin, Streptomycin sulphate, Ampicillin sodium, Ampicillin, Ampicillin trihydrate, Cloxacillin, Erythromycin thiocyanate, Tiamutin hydrogen fumarate, Tylosin tartarate, Chloramphenicol, Enrofloxacin, Flumequin, Ciprofloxacin, Pefloxacin, Norfloxacin, Norfloxacin nicotinate, Oxytetracycline, Oxytetracycline dihydrate, Oxytetracycline anhydrous, Tetracycline hydrochloride, Chlortetracyclin hydrochloride, Benzethonium chloride, Doxycycline, Neomycin sulphate, Gentamicin.

The active principle in the category Anthelmintics includes: Piperazine hydrate, Piperazinehexahydrate, Diethylcarbamazinecitrate, Mebendazole, Albendazole, Oxcyclozanide, Rafoxanide, Triclabendazole, Tetramisole, Levamisole, Closantel, Ivermectin, Praziquantel, Niclosamide, Morentel tartarate, Nitroxynil, Pyrantel pamoate.

The active principles in the category Non-steroidal anti inflammatory Drugs includes: Diclofenac sodium, Paracetamol and and Penylbutazone sodium.

Active principles in corticosteroids include: Dexamethasone sodium phosphate, Triamcenolone acetone, Predisolone acetate and betamethasone sodium phosphate.

Similarly, the active principles in Anticoccidials are; Maduramycin, Amprolium hydrochloride, Sulfaquinoxalin, Diaveridin hydrochloride, Dinitro-o -toluamide, Salinomycin, and Diclazuril.

The active principles in the category Sulfonamides include: Sulfa combinations, Sulfadimidine, Sulfadimidine sodium, Sulfamethaxazole, Trimethoprim, Sulfadiazine, Sulfachlorpyridiazine, Sulfadimethyl pyrimidine.

Similarly in Nitro furans: Nitrofurazone, Furaltadone and Furazolidone.

Antibiotic feed premix has the active principles: Flavomycin Virginiamicin, Bacitracin methyl disalicylate, Colistin sulphate, 3-nitro-4-hydroxyphenyl arsonic acid.

Similarly active principles in Antihistaminic are: Pheniramine maleate, Chlorpheniramine maleate.

Active principles in the category Antiprotozoals include: Diminazine aceturate, Quinapyramine sulphate, Quinapyramine chloride, Metronidazole and Buparvaquone.

Minerals are calculated as separate Mineral preparations and Mineral mixtures in terms of Kg. Similarly Vitamins are calculated separately in case of separate preparations and in combined form in case of Multivitamins and Mineral and Vitamin preparations are calculated separately either in lit.. Or Kg.

The remaining categories of preparations are calculated as total amount in form (Kg or Lit) it is supplied in the market. The total quantity is multiplied by the respective retail price and the total amount of money invested is calculated and the percentage shared by each category is figured out in terms of money.

5. Results:

Total amount of veterinary medicines and feed supplements worth NRs. 492 millions is consumed annually in Nepal. Out of this, drugs worth NRs. 81743201 (19.89%) are produced, whereas drugs worth NRs. 410927353 (80.1%) are imported into Nepal through several importers.

Out of the total drugs used, the percentage shared by a specific category of drug is given in the following table:

Table 1. Percentage shared by a specific category of drug.

S.N.	Category of drugs	Worth (NRs.)	Percentage shared (in terms of money)
1.	Vitamins, Minerals, Amino acids and Probiotics.	188284249.00	38.24
2.	Ayurvedic preparations	74102456.00	15.05
3.	Anthelmintics	70705068.00	14.36
4.	Antibiotics	64747329.00	13.15
5.	Anticoccidials	25603506.00	5.2
6.	Sulphonamides	20138142.00	4.09
7.	Performance enhancers	11423102.00	2.33
8.	Toxin binders	9749027.00	1.98
9.	Nitrofurans	7582576.00	1.54
10.	Liver tonics	6548589.00	2.32

11.	Miscellaneous *	13786503.00	2.8
	Total	492670547.00	100

* Ruminotorics, Electrolytes, Infusion fluids, Disinfectants and Water sanitizers, Non steroid anti inflammatory drugs, Corticosteroids, Antihistaminics, Ect-endoparasiticidals and Antiprotozoals.

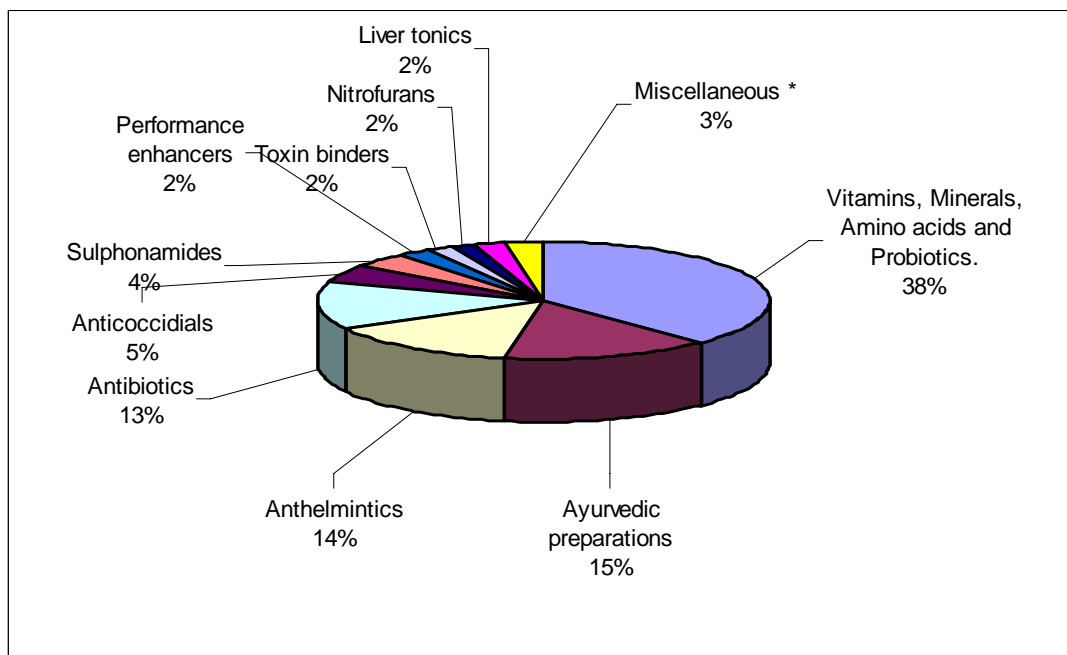


Fig.1 Percentage shared by different categories of drugs (in terms of money)

Table 2. Annual consumption of Feed supplements, Treatment products and Ayurvedic preparations (in terms of money)

S.N.	Category	Worth (NRs.)	Percentage
1.	Feed supplements	216233106.00	43.89
2.	Treatment products	202241262.00	41.05
3.	Ayurvedic preparations	74146918.00	15.05
Total		492670554.00	100.00

The amount of Feed supplements, Treatment products and Ayurvedic preparations consumed is equivalent to 43.89%, 41.05% and 15.05% respectively.

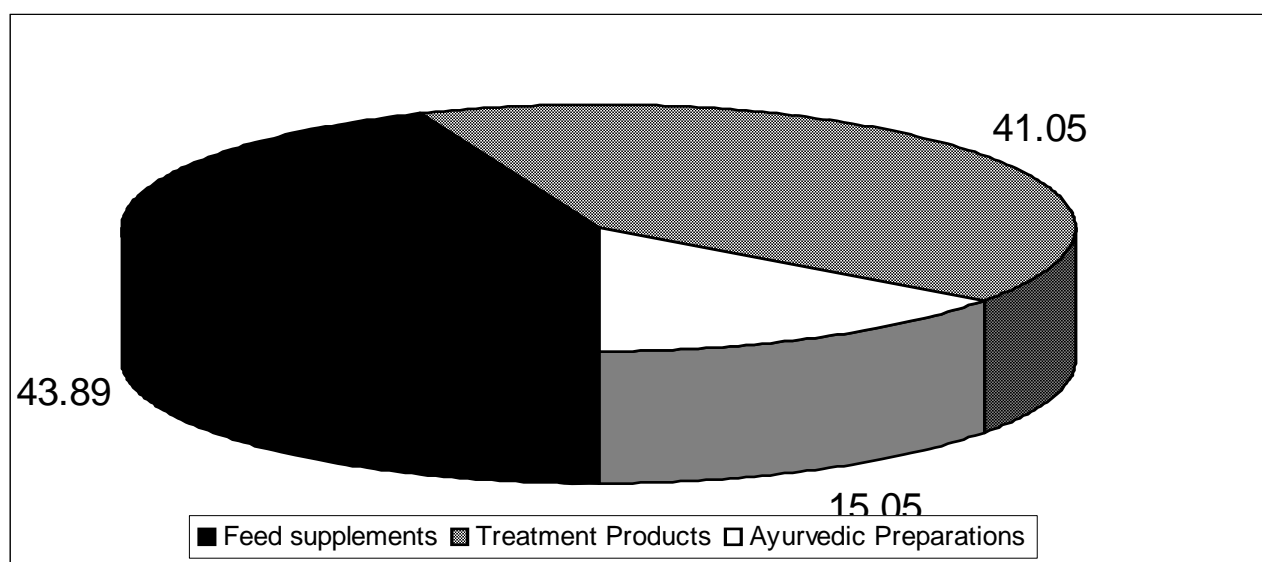


Fig.2. Annual consumption of Feed supplements, Treatment products and Ayurvedic preparations (in terms of money)

Table 3. Quantity of Antibiotics consumed Annually

S.N.	Antibiotics	Quantity (Kg.)
1.	Tetracyclines	7899
2.	Enrofloxacin	529.1
3.	Neomycin+ Doxycycline	229.47
4.	Ampicillin	137
5.	Tiamutin	109.46
6.	Cephalexin	92
7.	Ampicillin+ Cloxacillin	90.02
8.	Doxycycline+ Colistin sulphate	88.38
9.	Gentamicin	75.53
10.	Tylosin	71
11.	Penicillin+ Streptomycin	48.97
12.	Flumequin	16.96
13.	Chloramphenicol	16.5

Table 4. Quantity of Anthelmintics consumed Annually

S.N.	Anthelmintics	Quantity (Kg)
1.	Piperazine	4241.5
2.	Albendazole	1733
3.	Oxyclozanide	1593.5
4.	Levamisole	453.78
5.	Tetramisole	358.0
6.	Fenbendazole	229.9
7.	Mebendazole	57.2

8.	Rafoxanide	11.5
9.	Morantel	10.5
10.	Closantel	2.66
11.	Ivermectin	1.75
12.	Praziquantel	0.72
13.	Carbon Tetra Chloride	55.13 (lit.)

Table 5. Quantity of Anticoccidials consumed Annually

S.N.	Anticoccidials	Quantity (Kg)
1.	DOT	1117.5
2.	Maduramycin	1071
3.	Salinomycin	636
4.	Amprolium	442.83
5.	Sulphalquinoxaline	68.5
6.	Sulphachlorpyridiazine	60.48
7.	Diclazuril	37.6
8.	Monensin	25
9.	Ethopabate	2.24

Table 6. Quantity of Sulphonamides consumed Annually

S.N.	Sulphonamides	Quantity (Kg.)
1.	Sulphadimidine	3354.65
2.	Sulpha + Trimethoprim	1704.47
3.	Sulphadimethylpyrimidine	262.5

Table7. Quantity of Nitrofurans consumed Annually

S.N.	Nitrofurans	Quantity (Kg.)
1.	Furazolidone	1003.9
2.	Furaltadone	574.9
3.	Nitrofurazone	2.5

Table 8. Quantity of Anti histaminics consumed Aannually

S.N.	Anti histaminics	Quantity (Kg.)
1.	Chlorpheniramine maleate	14.71
2.	Pheniramine maleate	12.95

Table 9. Quantity of Non-Steroidal Anti-Inflammatory Drugs consumed Annually

S.N.	NSAIDs	Quantity (Kg.)
1.	Diclofenac	49.37

2.	Diclofenac+ Paracetamol	39.24
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Table 10. Quantity of Corticosteroids consumed Annually

S.N.	Corticosteroids	Quantity (Kg.)
1.	Dexamethasone	1.536
2.	Prednisolone	.288

Table 11. Quantity of Amino acids, Vitamins, Minerals and Probiotics consumed Annually

S.N.	Preparations	Quantity
1.	Oral liquid	183847.3 lit.
2.	Injections	327.63 lit.
3.	Feed premixes	450537.96 Kg.

Table 12. Quantity of Liver tonics consumed Annually

S.N.	Liver tonic preparations	Quantity
1.	Liquid	6955.6 lit.
2.	Powder	27243.5 Kg.

Table 13. Quantity of Miscellaneous preparations consumed Annually

S.N.	Preparations	Quantity
1.	Performance enhancers	25531 Kg.
2.	Toxin binders	81205 Kg.
3.	Electrolytes	3514.7 Kg.
4.	Infusion fluids	16947.6 Lit.
5.	Disinfectants and Water sanitizers (liq.)	73987 Lit.
6.	Disinfectants and Water sanitizers (pv.)	144 Kg.
7.	Antiprotozoals	6.25 Kg.

6. Discussion

The present study indicates that huge amount of money is used in livestock and poultry production for feed premix and medication. To find out whether the return from livestock and poultry products in comparison to the use of feed supplements and medicines is cost effective or not, further study should be carried out.

In a study, liver tonics feed premix preparations were not found to be profitable (Thapalia and Bhattarai,2001) in broiler birds. It may also be due to the late acting nature of herbal preparations. So in our context, extensive study is indicated for each category of drugs to find out whether their use is profitable or not.

The reason behind the excessive consumption of antibiotics may be their haphazard use and even the latest generations of antibiotics are used, which has created antibiotics

resistance problems. In field conditions, especially in poultry, drug withdrawal period is not considered and antibiotics are used till marketing. From the public health point of view, the impact of residual effect of drugs should be assessed.

The consumption of drugs is not found to be uniform throughout the country. It is higher per animal or bird in livestock/poultry pocket areas and lesser per animal in other areas. Further study is necessary to find out the drug consumption per animal or bird to make comparison with that of other countries.

7. Conclusions and Recommendation

Present study revealed that Nepal is an excellent market for veterinary medicines and feed supplements. The quantity of these preparations produced inside the country is very nominal and majority of the amount is being imported. So, there is a great scope of veterinary medicines and feed supplements and manufacturing in Nepal. The most widely used category of drug preparations is Vitamins, Minerals, Amino acids and Probiotics followed by Anthelmintics, Antibiotics, Anticoccidials and Sulphonamides. So, a manufacturer/importer should concentrate his efforts towards the manufacture/import of these categories of preparations and government should formulate supportive policies to flourish the manufacturing of these preparations.

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