

## Veterinary Drugs Found in Pharmacies in Turkey

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### Abstract

In this study veterinary drugs in RxMediapharma 2017 which actively used in pharmacies in Turkey were scanned. These veterinary drugs offered for sale in pharmacies are given active substances, animals used, drug form, route of application, local or imported. According to this result, Ministry of Health Licensed 1; Ministry of Food, Agriculture and Livestock Licensed 56 local and 23 imported and a total of 79 veterinary drugs were detected. In addition, when the Ministry of Food, Agriculture and Livestock Licensed drugs are grouped according to their pharmacological effects, it is determined that the licensed drug group which has the highest number with 43.75% is antibiotics. Although there are various studies concerning veterinary drug, It is given as Turkey-scale all of these drugs has not been observed in an article expect e-data, and the data collected electronically, has been submitted to any scientific community. For this reason, it is thought that this study, which compiles veterinary drugs emphasizing therapeutic potential, will form the basis for future research.

**Keywords:** Veterinary drugs, pharmacy, Turkey, Ministry of health, Ministry of food- agriculture and livestock, RxMediapharma,

### 1. Introduction

Veterinary drugs; is a combination of chemicals and chemical substances used to preserve and improve animal health (Yarsan 2015). Since ancient times, veterinary medicines have been used to treat diseases, to prevent diseases, to increase efficiency, to accelerate the development and growth of animals (Ozturk 2002). Veterinary medicine in which these substances are used has a large number of preparations belonging to various pharmacological groups such as vitamins, mineral supplements, antibiotics, analgesics and electrolytes as well as human medicine (DPT 2001).

In veterinary medicine; the use of medicines for different purposes in the treatment of animal diseases. Therefore, veterinarians; they use the electronic environment in which detailed information about the medicines they use is contained. Although the studies about this issue with some veterinary drugs, veterinary medicines including a drug database through Turkey does not have a working scale. In this study, a drug database that RxMediapharma® 2017, based on the Ministry of Health found in pharmacies in Turkey licensed and Ministry of Food, Agriculture and Livestock subtracting list of licensed veterinary pharmaceutical active ingredients in the content of these drugs, animals are used, drug form, route of administration, local or import status and the location of the treatment.

### 2. Methods

In this study, based on RxMediapharma® 2017, is located in pharmacies in Turkey in 2017, the Ministry of Health and Ministry of Food, Agriculture and Livestock licensed local and imported veterinary drugs were examined.

### 3. Results

In this study, according to RxMediapharma® 2017 data, vitamins, mineral supplements, electrolytes, antibiotics (systemic, local), anthelmintics, ectoparasites, antiprotozoals, endectosides, antiinflammatorys, analgesics, antirheumatic drugs, gastrointestinal system drugs, anticholinergics drugs, analeptic drugs, genitourinary system drugs and sex hormones, hormones, antiseptics and disinfectants, non-therapeutic products are screened and the preparations, the active substances of the preparations, the animals used, the drug form, the route of administration, local or imported status are given in Table 1-17 respectively.

**Table 1:** Ministry of Food, Agriculture and Livestock (MFAL) Licensed Vitamins

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/ Imported
Adevet	Vitamin D <sub>3</sub> (75.000 IU) Vitamin E (50 IU) Retinol Propionate (500.000 IU)	Horse, Goat, Sheep, Lamb, Rabbit, Capricorn, Cattle	IM (Intramuscular), SC(Subcutaneous)	Local
Ademin Injectable Solution	Vitamin A (500.000 IU) Vitamin E (50 mg) Vitamin D <sub>3</sub> (75.000 IU)	Veal, Moss, Heifer, Goat, Sheep, Lamb, Rabbit, Cattle	IM, SC	Local
Akavit Oral Powder for Solution	Vitamin K <sub>3</sub> (10 mg) Retinol Acetate (25.000 IU)	Calf, Chick, Turkey, Goat, Sheep, Lamb, Capricorn, Chicken, Cattle	Oral	Local
Bakosel Soft Gelatin Capsule	Dicalcium phosphate (150 mg) Vitamin E (500 IU) Sodium selenite (2.5 mg) Copper sulphate (10 mg) Cobalt (II) sulfat 12.5 mg	Calf, Beef, Heifer, Moss, Goat, Sheep, Lamb, Capricorn, Cattle	Oral	Local
Berovit B <sub>12</sub> Injectable Solution	D-Pantenol (10 mg) Niasinamit (20 mg) Vitamin B <sub>12</sub> (4 mg) Vitamin B <sub>1</sub> (5 mg) Vitamin B <sub>6</sub> (2 mg) Vitamin B <sub>2</sub> (2 mg)	Calf, Beef, Heifer, Moss, Goat, Sheep, Lamb, Capricorn, Cattle, Cat, Dog, Mandate, Thai, Horse	IM, SC	Local
Injacom-C Injectable Solution	Vitamin C (200 mg)	Horse, Calf, Veal, Heifer, Moss, Goat, Sheep, Cattle, Cat, Dog,	IV( Intravenous ), IM	Local
Thiabral Injectable Solution	Vitamin B <sub>1</sub> (5.75 g) Vitamin B <sub>6</sub> (0.55 g)	Horse, Calf, Goat, Sheep, Cat, Dog, Cattle, Thai	IV, IM	Local
Yeldif Injectable Suspension	Vitamin B <sub>1</sub> (40 mg) Vitamin E (60 mg) Sodium selenite (1mg)	Horse, Calf, Goat, Sheep (Pregnant), Lamb, Cattle (Pregnant)	IM, SC	Local

**Table 2:** MFAL Licensed Mineral Supplements

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/ Imported
Kaldif	Boronic Acid (7.29)	Goat, Sheep,	IV, SC	Local

Fort Injectable Solution	g) Calcium Gluconate (38.71 g) Magnesium Chloride (6.5 g) Calcium Hydroxide (1.32 g)	Cattle		
Tildren Injectable Powder for Solution	Tiludronic Acid (50 mg)	Horse	Perfusion, IV	Imported

**Table 3:** MFAL Licensed Electrolytes

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local / Imported
Glutellac Oral Solution	Dextrose monohydrate (19.5 g) Potassium chloride (3.2g) Sodium acetate (18.32 g) Sodium chloride (3.2g) Sodium diacetate (1.6 g)	Calf, Cattle	Oral	Imported
Rehydion Gel	Potassium (4.5%) Sodium (11.5%) Chloride (8.6%)	Calf, Cattle	Oral	Imported

**Table 4:** MFAL Licensed Systemic Antibiotics

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/ Imported
Animar Injectable Solution	Trimetoprim (40mg) Sulfadoxine (200mg)	Horse, Beef, Heifer, Moss, Goat, Sheep and Dog	IV, IM, SC	Local
Biotrin Oral-Intrauterine Tablet	Sulfadiazine (1000mg) Trimethoprim (200mg)	Goat, Sheep, Cat, Calf, Horse	Oral	Local
Cenmicin-LC Injectable Solution	Sipektinomycin (100 mg) Linkomycin (50 mg)	Sheep, Cattle	Injection and Other	Imported
Cevaxel Rtu Injectable Suspension	Ceftiofur (50 mg)	Cattle	SC	Imported

Danomed Oral Powder for Solution	Danofloxacin (100mg)	Turkey and Chicken (fed for meat)	Oral	Local
Devamisin Oral / Intra-uterine Tablet	Chlortetracycline (500 mg)	Horse, Goat, Sheep, Cattle	Oral, Intra-uterine	Local
Diaqua Oral Powder	Sulfadiazine (416.7 mg) Trimetoprim (83.3 mg)	Fish	Oral	Local
Epimycin Powder for Solution	Erythromycin (210 mg)	Chicken	Oral	Local
Ertruth Oral Solution	Erythromycin (350 mg)	Chicken	Oral	Local
Florkem Injectable Solution	Florfenicol	Cattle	IM, SC	Local
Gabbrocol Powder for Oral Solution	Paramomycin(70 mg)	Calf	Oral	Imported
Marbox Injectable Solution	Marbofloxacin	Cattle	IV, IM, SC	Imported
Medicalin Powder for Oral Solution	Lincomycin (%40)	Chicken, Turkey	Oral	Local
Medicamox Powder for Oral Solution	Amoxicillin (500 mg)	Chicken, Turkey (fed for meat)	Oral	Local
Medicatey Powder for Oral Solution	Tylosin (%100)	Chicken, Turkey (fed for meat)	Oral	Local
Mediflor Oral Solution	Florfenicol (300 mg)	Chicken (fed for meat)	Oral	Local
Moksidif La Injectable Suspension	Amoxicillin (150 mg)	Sheep, Cattle	IM	Imported
Neo-500 Powder for Oral Solution	Neomycin(500 mg)	Horse, Turkey, Chicken, Calf, Capricorn, Sheep	Oral	Local
Nuflor Minidose Injectable Solution	Florfenicol (450 mg)	Cattle	IM, SC	Imported
Preventium Powder for	Tiamulin(450 mg)	Chicken, Turkey (fed	Oral	Local

Oral Solution		for meat)		
Proflox Injectable Solution	Enrofloxacin (130 mg)	Sheep, Cattle	IV, IM, SC	Local
Spectam Oral Gel	Spectinomycin (50 mg)	Lamb, Calf	Oral	Local
Sulphamezathine % 16 Oral Solution	Sulfadimidine (160 mg)	Turkey (fed for meat), Goat, Sheep, Cattle, Chicken (fed for meat)	Oral	Local
Spirovet Injectable Solution	Spiramycin (600.000 IU)	Calf, Cattle	IM	Imported
Tenaline La Injectable Solution	Oxytetracycline (200 mg)	Goat, Cattle, Sheep	IM	Imported
Tetradil Powder for Oral Solution	Oxytetracycline (120 mg) Sulfadimidine (800mg)	Dog, Calf, Lamb, Thai	Oral	Local
Tetramed Powder for Oral Solution	Tetracycline (500 mg)	Turkey, Chicken, Calf	Oral	Local
Tetramezatin Powder for Oral Solution	Oxytetracycline (0.3 g) Sulfadimidine (2 g)	Capricorn, Calf, Dog, Lamb, Thai	Oral	Local
Tetramisin Injectable Solution	Oxytetracycline (30 mg) Lidocaine (20 mg)	Horse, Cat, Dog	IV, IM, SC	Local
Tiamvet 100	Tiamulin(10 g)	Chicken	Oral	Imported
Tilocen-20 Injectable Solution	Tylosin (200 mg)	Cattle, Sheep	IM	Imported
Vetakoksin Oral Solution	Sulfaquinoxaline (32mg)	Pigeon, Chick, Budgerigar, Parrot, Canary, Pheasant, Chicken (fed for meat), Turkey (fed for meat)	Oral	Local

**Table 5:** MFAL Licensed Local Antibiotics

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/ Imported
Gentavet-D	Gentamicin (3	Rabbit, Turkey,	Topical	Local

Skin Ointment	mg)	Horse, Dog, Sheep, Goat, Cattle		
Lincogemast In-breast ointment	Gentamicin (80,000 IU) Linkomycin (250,000 IU) Prednisolone (5mg)	Cattle	In-breast	Imported
Piyedif NG Skin Spray	Thiamphenicol (2.85%)	All species	Topical	Imported

**Table 6:** MFAL Licensed Anthelmintics

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Alenzol/K Tablet	Albendazole (375 mg)	Sheep	Oral	Local
Anfenzan Tablet	Oxyclozanide (600 mg) Oxfendazole (300 mg)	Sheep, Cattle	Oral	Local
Fortezol Tablet	Oxyclozanide (900 mg) Oxfendazole (450 mg)	Sheep, Lamb, Cattle, Calf, Beef, Heifers, Moss	Oral	Local
Levadif Granule for Oral Solution	Levamisole (15 g)	Owl, Goose, Budgerigar, Duck, Parrot, Ostrich, Chick	Oral	Local
Levatrizol Tablet	Levamisole (375 mg) Triclabendazole (600 mg)	Calf, Sheep, Lamb, Cattle	Oral	Local
Levazanid Tablet	Levamisole (375 mg) Oxyclozanide (750 mg)	Calf, Beef, Heifer, Moss, Sheep, Cattle	Oral	Local
Mamdezol Tablet	Oxyclozanite (750 mg) Oxfendazole (375 mg)	Calf, Veal, Heifer, Moss, Sheep, Lamb	Oral	Local
Nilverm Powder for Oral Solution	Levamisole (150 mg)	Owl, Goose, Budgerigar, Duck, Parrot, Ostrich, Chick, Turkey (fed for meat), Chicken (fed for meat), Pheasant	Oral	Local
Nilzan Fort	Levamisole (150 mg)	Sheep, Cattle	Oral	Local

Tablet	mg) Oxyclozanite (300 mg)			
Okzan-F Tablet	Oxyclozanite (750 mg) Oxfendazole (250 mg)	Sheep, Cattle	Oral	Local
Profender Dripping Solution	Praziquantel (85.8 mg) Emodepsite (21.4 mg)	Cat	Topical, Dermatologic	Imported
Tenyasid Capsule	Pyrantel embonate (144mg) Praziquantel (50 mg) Febantel (150 mg)	Dog	Oral	Local
Vetalben Tablet	Albendazole (200 mg)	Sheep, Cattle	Oral	Local

**Table 7: MFAL Licensed Ectoparasiticides**

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Bayticol %1 Solution for pouring	Flumethrin (10 mg)	Cattle	Topical, Dermatologic	Local
Flugon %1 Solution for pouring	Flumethrin (10 mg)	Sheep, Cattle	Topical, Dermatologic	Local

**Table 8: MFAL Licensed Antiprotozoals**

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Fumidil-B Powder for Syrup	Fumagillin (500 mg)	Bee	Oral	Local
Coccil Oral Suspension	Toltrazuril (50 mg)	Sheep	Oral	Imported

**Table 9: MFAL Licensed Endectocides**

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Ultramec Forte %2 Injectable Solution	Ivermectin (20 mg)	Shhep, Cattle	IM, SC	Local
Eprecis Injectable Solution	Eprinomektin(10 mg)	Cattle	SC	Local

**Table 10: MFAL Licensed Antiinflammatory, Analgesics and Antirheumatic Drugs**

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Vetakort 4 mg Injectable Solution	Dexamethason e (4 mg)	Horse, Cat, Dog, Cattle, Thai	IV, IM, SC, IA	Local

			(Intraarticular)	
Difaljin Injectable Solution	Metamizole Sodium (500 mg)	Heifer, Thai, Moss, Horse, Dog	IV, IM	Local
Flunifen Injectable Solution	Flunixin (50 mg)	Horse, Cattle	IV, IM	Imported
Novo-cyan Injectable Solution	Metamizole Sodium (5000 mg) Lidocaine hydrochloride (1.5%) Vitamin B <sub>12</sub> (4000 mg) Vitamin B <sub>1</sub> (1000 mg) Vitamin B <sub>6</sub> (100 mg)	Horse, Dog, Thai	IM	Local

**Table 11:** MFAL Licensed Gastrointestinal System Drugs

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Asivet Emulsion	Simeticone (30 mg)	Horse, Goat, Sheep, Cattle, Thai	Oral	Local
Mete Oral Emulsion	Dimethylpolysiloxane (%2.5)	Horse, Calf, Goat, Sheep, Thai	Oral	Local

**Table 12:** MFAL Licensed Anticholinergic Drugs

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local / Imported
Vetaş Atropin %2 Injectable Solution	Atropine Sulfate	Horse, Calf, Goat, Sheep, Beef, Heifer, Moss, Capricorn	IV, SC	Local

**Table 13:** MFAL Licensed Analeptic Drugs

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/ Imported
Kafedif Injectable Solution	Caffeine (250 mg) Sodium Benzoate (350 mg)	Horse, Goat, Cat, Cattle, Dog	SC	Local



**Table 14:** MFAL Licensed Genito Urinary System Drugs and Sex Hormones

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Enzaprost-T Injectable Solution	Dinoprost (5 mg)	Horse, Cattle	IM	Imported
Prid-delta Intravajinal	Progesterone (1.55 g)	Cattle	Intravaginal	Imported

**Table 15:** MFAL Licensed Hormones

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Ovarelin Injectable Solution	Gonadorelin diacetate tetrahydrate (50 mcg)	Cattle	IV, IM	Imported
Regulin Implant	Melatonin (18 mg)	Sheep	SC	Imported

**Table 16:** MFAL Licensed Non-Therapeutic Products

Drugs	Active substances	Animal used of the drugs	Routes of Administration	Local/Imported
Cevamune Effervescent tablet	Patent Blue V (1200 mg) Sodium Thiosulfate (1500 mg)	Owl, Chick, Ostrich, Dogan, Pigeon, Canary, Pheasant, Love Bird, Duck, Parrot, Hawk, Goose, Chicken	Oral	Imported

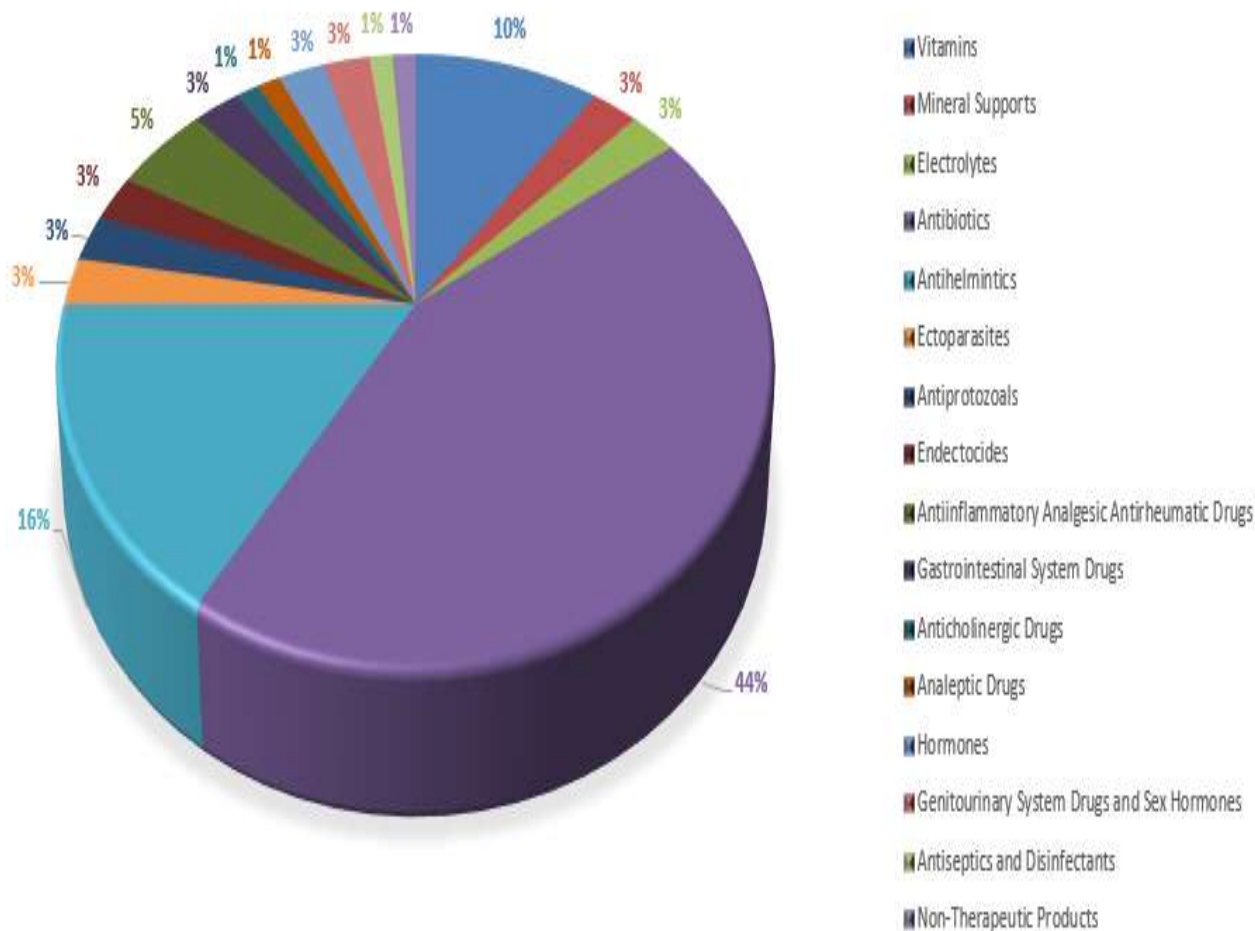
**Table 17:** Ministry of Health Licensed Antiseptics and Disinfectants

Drugs	Active substances	Microorganisms that drugs is effective	Routes of Administration	Local/Imported
Dezen %20 Solution	Benzalkonium Chloride (20%)	<i>E.coli</i> , <i>S.aureus</i> , <i>P.aeruginosae</i> , <i>C.albicans</i> , <i>S.pyogenes</i>	Surface (Sliding, Spraying, Dipping)	Local

(RxMediapharma 2017) Percentage distributions of the preparations according to pharmacological groups are given in Figure 1.

In this study, Ministry of Health Licensed 1; The Ministry of Food, Agriculture and Livestock has registered 79 veterinary drugs, 56 of which are local and 23 of which are imported. The Ministry of Food, Agriculture and Livestock Licensed and Ministry of Health lists 80 licensed preparations and describes the active

substances, animals used, drug form, route of application, local or imported status contained in the preparations. There are also 364 Ministry of Food, Agriculture and Livestock Marketing Permits and 298 Ministry of Agriculture and Rural Affairs licensed drugs that are not included in the scope of the study. Ministry of Food, Agriculture and Livestock Ministry of Health, when the licensed drugs are grouped according to their pharmacological effects, the licensed drug group which has the highest number with 43.75% is antibiotics and this percentage is shown by the percentages that anthelmintics followed by 16.25%. Vitamins with a ratio of 10%; Antiinflammatory Analgesic Antirheumatic Drugs in a ratio of 5%; Mineral Supports, Electrolytes, Ectoparasites, Gastrointestinal System Drugs, Hormones, Genitourinary System Drugs and Sex Hormones; Anticholinergic Drugs, Analeptic Drugs, Antiseptic and Disinfectants and Non-Therapeutic Products were observed in 1.25% (Figure 1).



**Figure 1:** Distribution chart of the Ministry of Food, Agriculture and Livestock licensed drugs of the according to pharmacological groups

#### 4. Discussion and Conclusion

In veterinary medicine; the use of medicines in order to serve different purposes, especially in the treatment of animal diseases (Yarsan 2015). When the history of veterinary drug use in the world is examined, it is not known how and how veterinary drugs are used for the first time, but it is accepted that they have been used since the localation of animals (Ozturk 2002). After the localation of animals, it has been seen in various books where veterinary drug recipes have been developed and used since ancient times. One of these books, İbn Baytar, was mentioned together with veterinary and human environment drugs in the "Kitab al-Cami fi-l-Adviya al-Mufrada" (Asil 2001, Baytop 1985, Erk 1955, Sarton 1950). It is noteworthy that in some of the works called "Baytarname" the information about the veterinary medicine belonging to the Islamic Civilization Age is reached and the information about how and how the medicines can be used in some ways is presented with pictorial descriptions (Dincer and Erk 1967, Dincer 1982). Considering the history of veterinary drug use in Turkey in 1842 opened the first Veterinarians have begun to use drugs with the school, although the sectoral sense of progress after 1950 as başlamıştır.1950'l year has also increased the veterinary drug production with the increase of local pharmaceutical factories (Ozturk 2002).

Production and licensing of veterinary medicines in our country is carried out by the Ministry of Food, Agriculture and Livestock and the Ministry of Health. The production and use of unlicensed veterinary medicines from the Ministry is legally prohibited. The license of the licensed drug is canceled when it is considered inadequate in terms of efficiency and safety. The availability of licensed veterinary medicines, pharmacy and clinic sales areas may be possible with quality, reliability and efficacy criteria (3). Ministry of Health Licensed 1 in our work; The Ministry of Food, Agriculture and Livestock has registered 79 veterinary drugs, 56 of which are local and 23 of which are imported. There are also 364 Ministry of Food, Agriculture and Livestock Marketing Permits and 298 Ministry of Agriculture and Rural Affairs licensed drugs that are not included in the scope of the study.

In addition, the use of veterinary medicines on the market in veterinarian control and in the counseling of pharmacists who have been trained in this field is extremely important in terms of community health. Unconscious use of these drugs can have serious consequences. For this reason, it is necessary for the veterinarians to record the disease situation in animals, the effect of the applied drugs, the dosage and the frequency of application, the information about the target animal and the indication status in electronic form. This study used in pharmacies in Turkey rxmediapharma® maintained under active electronically scanned and recorded using a 2017 veterinary drugs have been listed. According to this result, the most licensed drug group is antibiotics and this is followed by anthelmintics, vitamins, antiinflatuar analgesic antirheumatic drugs, mineral supplements, electrolytes, ectoparasitists, gastrointestinal system drugs, hormones, genitourinary system drugs and sex hormones, anticholinergic drugs, antiseptic and disinfectants and non-therapeutic products have been identified.

In the framework of the results obtained from this research in our country in the field of animal health, animal diseases and drug database that is used to perform an effective fight against pests (rxmediapharma®) organized by reference, veterinary medicines that are available in pharmacies in Turkey and their active substances, animals used drugs form, method of administration, local or imported situation is considered as the first work in the collective, given that veterinarians and pharmacists are expected to provide great benefits for their work. This research is thought to be a source of hope in protecting society and animal health, together with future work in this regard.

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