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## A STUDY OF THE VETERINARY SECTION OF IBN AL - AWWAM'S «KITAB AL - FALÂHA» \*

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In the twelfth century there was produced in Spain a celebrated treatise on agriculture and veterinary medicine by Abu Zakariya Yahya bin Muhammed ibn Ahmed ibn al - Awwam al - İshbili.

There is not much information on the author's life. According to Huska (4) he was born in İshbilia (Sevilla) and lived toward the end of the twelfth century and wrote a valuable book. Brockelman (1) states there are copies of this treatise in Leid. 1285, Paris 2804, and British Museum 998.

According to Sarton (5) Kitab al-falâha was edited with a Spanish translation by Jos. Ant. Banqueri in Madrid in 1802. It was also translated into French by Clement Mullet in 1864-1867, but both were unsatisfactory.

According to Leclainche (3) it was retranslated into Spanish by Claudio Boutela in 1878.

A Turkish translation was made in 1590 (998 Hegira era) by Muhammed bin Mustafa. There is a copy of this in Beyazıt General Library, department of Velieddin No: 2534. This is the copy with which I worked. Brockelman (1) mentions another copy of this in Bursa, Asarı atike Müzesi E. 32.

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This Turkish translation has 470 closely written pages and is divided into thirty four chapters. The first thirty chapters deal with agriculture and end at the page 394, and the last four chapters deal with animal husbandry and veterinary medicine. In these last chapters ibn al - Awwam mentions Aristotle, Dioscorides, Galeh, Kisinós (?), Kastós (?) and Hizzam (IX. the century moslem veterinarian). The 31st chapter of the book or the first veterinary chapter's title is «The Selection of cattle, sheep and goats; gestation period; diseases and cures etc.»

The directions for selecting breeding cattle are good. He recommends one shepherd (cattle driver, cowboy) for each 100 cattle. The cow usually gives birth to one calf, sometime twins. The cattle live for fifteen years, but if they are well managed they may live longer. Before mating cow should be at least one year old, but in native cows two years of age is better. During their lives cows usually give birth to 15 calves. Gestation period in the cow is nine or ten months (?). Fatness is one the causes of infertility. Usually one bull is enough for 20 cows. During the mating period the bull should be well fed.

Following this good information ibn al - Awwam writes that after coitus if penis inclines to the right, the calf will be male and vice versa. For bad (ill) tempered bulls he recommends some useful methods.

While on pasture the cattle can suffer from two important diseases 1 — Nekris in the leg (?) a rheumatism like disease. 2 — Sudam (piroplasmiasis) which he says similar to human malaria, the animal's body is very hot and post mortem examination shows hyperemic lungs. He recommends bay leaf decoction and white lead for fly bites. He is aware of the effect of snow and cold weather.

Tare is a good feed for cattle and goats, but not for sheep. Millet is also good. Cattle prefer clear water.

Sheep selected as breeders should have soft and thick fléeces, small heads, long necks, and small hoofs. A ram for breeding purposes must not mate before three years of age (?) and the best time for this is spring. Gestation period is five months in sheep. Some good sheep may lamb twice a year. For 20-50 sheep one ram is enough. Longevity of the sheep is 10-15 years and they may deliver 8-11 lambs, some of which may be twins. The tails of Armanian and Damascus sheep measure an arşin (60 cm). The colour of under surface of the tongue of the ewe indicates the colour of their offspring. He describes mange in sheep and employs oil dressings and sulphur. He says castration of the ram and the pig causes fatness.

For these making he believes sheep milk is the best, and after this comes cow and goat milks respectively.

Goats give birth once a year, but better feeding and warm climate can make this twice.

Ibn al-Awwam's discussion of breeding in this chapter is satisfactory. He describes a piroplasma like disease as being very important in cattle, and scabies as being important in sheep. He does not mention any diseases of the goats.

The thirty second chapter bears the title: Selection of horse, mule, donkey, and camel; their mating time, gestation period, longevity; their fodder, to fatten or to make them slim and treatment of bad habits.

The mule is an offspring of a male donkey and a mare. It should be neither big nor small, should have strong extremities, and a large and strong body. The gestation period in donkeys is twelve months. Their most dangerous and destructive disease attacks the head, causing a copious nasal discharge (glanders). This disease also attacks the thigh (farcy).

If the urine of donkeys is blood red, honey and bitter almond mixture is a useful remedy. The camel can live for 30 years, it does not like to drink clear water (?), and can go for days without water.

Mange is an important disease in camels. It is treated with tar.

Mares and stallions for breeding purpose must be strong, healthy and free of all kind of diseases and bad habits. Mares should be at least two years old for breeding purposes and can give birth until 20 years of age. The horse may live as long as forty years, sometimes even longer (?).

After coitus if mare becomes pregnant, she refuses to copulate again. Pregnant mares must be kept in a warm place and need good care.

After all this almost correct information ibn al-Awwam is superstitious about predicting the sex of the coming colt. On the eighth day after parturition the mare is ready to mate. Gestation period in the horse is eleven or eleven and half months. If the mare has any uterine disease she should not be allowed to mate. Some mares can be sterile. Nursing of the colt is important. Spring is the best time for mating. For thirty or more mares one stallion is enough. In this chapter information on horse conformation is detailed.

The horse's ears should be erect, the chinks thin, the nostrils large, neck long and slim, chest broad, loins long, hoofs strong and

dark coloured, tongue and teeth medium in size. Knock knees, bandy legs, hoof knocking, night blindness (Nyctalopia) and deafness are serious faults.

In well bred race horses one year old foals should have small heads, fine hair, strong bodies, and round hoofs.

On training of colts ibn al-Awwam is very satisfactory, like other Moslem veterinary writers. He is also good on determination of the age of horses by examining the teeth. The first four teeth, sunaya (2 temporary centrals), are cut when the colt is 5-9 days old. At the end of two months another four, rubai (2 temporary laterals), and at the end of the eighth or ninth month the final four, kavarih (2 temporary corners) are cut. After two years permanent teeth begin to cut. Milk teeth are small, white and smooth faced. The permanent teeth are yellowish and bigger than the milk teeth.

He names canines enyab, and molars adras, but he does not mention their cutting time. When the horse is four years old the permanent centrals come into wear. At the fifth year the permanent laterals come into wear and at the end of six years all incisors are wearing. His information on this subject ends here.

Barely, clover, and hay are good for horses. Horses are to be fed separately. He gives information on quantities of every kind of fodder and recommends that green hay be fed for 40 days in a year. Water can be given at any time except when animal is sweating. Horses usually do not want clear water; here again he repeats the old belief that the horse sees its reflection in clear water and is afraid of it.

Mangers are to be kept clean and divided and perforated to get rid of the dust of the fodder. They should be high. Stone or lime is not good for the floors of the stable, because they harm the hoofs of the horse. Sand is better for this purpose. Stables should be kept very clean, and space for each horse must be large enough.

Dieting and daily exercise are recommended for horses, and every day care includes rubbing horses with a haircloth.

For correcting bad habits of horses he recommends gentle handling, and sometimes keeping them without water for a time. On this subject he gives quite a long discussion. He never approves violent methods, especially for thorough bred. He believes some of the bad tempers are hereditary.

The thirty third chapter deals with diseases of the horses from head to foot.

Firstly he mentions diseases of eye. For keratitis he recommends sulfur; at the beginning bleeding is useful. Redness in the eye due to

heat (?) can be cured with rose water; for night blindness pigeon blood is good. For conjunctivitis and blepharitis centaury, saffron, and for itchy (mangy) eyelids sulfur are used as treatments.

Diseases of nose, mouth, lips and ears are next dealt with. For bleeding nose salted cold water, for nasal discharge sal ammoniac and saffron, and for mange on the nose sulfur and mustard mixture is recommended. Polyps in nostrils are treated surgically. Here ibn al-Awwam mentions polyps in the rectum. Foaming and bad odor are the signs; old age and food are the cause of stomatitis; powder of pomgranate shells is recommended as a treatment. Gingivitis and loose teeth are also mentioned. Paralysis of nervus facialis is clearly described and cauterisation is recommended.

Headache (?) and diseases of the throat are mentioned next. But he describes some other diseases of chin and nose. Headache (?) can be on one or both sides of the head. Linseed cataplasm with vinegar is used. Botriomycosis is usually seen on the cheek and on the chin. Strangles is well described; he opens abscesses with a lancet. When there are leeches in the mouth or throat olive oil or inhalation (?) is used. Zembe (?) is a disease of throat, ears and testicles. Deafness is cured (?) by using animal fat. Mange in the ears is mentioned and again sulfur and olive oil is recommended. Melince (?) is not clearly described.

Ibn al-Awwam tells us that diseases of shoulder, back, thigh, and hip are to be dealt with next. But he describes a disease of the lungs with a dry mouth and bad odor. Another obscure disease, the heartache, is mentioned. He explains a disease under the title of «spleen» but not clearly. «Kidneyache» (?) is a disease accompanied by loss of appetite and red urine; white pepper is used as a treatment. Animals with the pain in the bladder (?) can not urinate but just drop. As treatment the tail and the back of animal is rubbed with olive oil. Sweet wine is given.

Some colics are described like rheumatic colic and meteorismus. In these cases enema with wine is recommended. Swallowed testicle and penis are to be cured with honey and olive oil. Warts (papillomata) on penis are mentioned, they are ligated with a hair of the tail. Dourine is described as a contagious disease, being transmitted from effected mares to stallions by coitus. He recommends irrigation with oil of rose and vinegar.

For intestinal parasites ibn al-Awwam recommends purgatives (?). Mange is again mentioned on the tail and treated as mentioned before.

Next ibn al-Awwam deals with foot diseases.

Chronic dermatitis of foot is mentioned. Crapodine (?) is usually seen in donkeys; its treatment is difficult, and prognosis is unfavourable. Chronic laminitis and sandcrack are described: excess feeding is one of the cause for the former and sometimes separation of the hoof occurs in this disease. Chronic coronitis is clearly described and fat is recommended as treatment. The diagnosis of quittor (?) and canker from the symptoms he gives is not easy. In canker an offensive odor is mentioned. He says that in some cases this disease is incurable although he recommends cauterisation or surgical treatment. Bruised sole is cured by cleansing the affected part of the sole and applying salted fat with garlic. Flegmon of the feet is mentioned. He describes corns and rigbone (?) and he recommends the same treatment for both diseases. He describes dermatitis verrucosa of the phalanx regions and recommends washing with warm water and ointment application. Mud and dirt are mentioned as the causes of this disease.

Bursitis in front of the fetlock (?), Capped elbow (?), Deep capped hock (?) are mentioned and hot tar is used for treatment. Some symptoms are given for sinovitis and knuckling at the fetlock (?). Hygromas and tendinitis are well described. In chronic cases of these he recommends cauterisation. There is a short paragraph on methods of cauterisation and deontology.

Rheumatism, gouty arthritis (?) and acute laminitis are mentioned. For acute laminitis bleeding and dieting is recommended.

After foot diseases ibn al- Awwam tells us that he will deal with unlocated (?) diseases.

Coughing is considered as one of the disease of this kind. The causes of coughing are cold, heat, and dust. Honey and garlic are good treatments. Two obscure diseases, accompanied by nasal discharge are mentioned. Under the name of «madness» he explained a somewhat doubtful disease. Next he promises to devote a few words to the castration time but on this subject he only recommends to keep the horse without food for a few days of before the operation. Again he deals with acute laminitis.

Lice and ticks are mentioned. He says they cause injuries to the skin and disturb the animal. Some ointments made with mercury and oil are used. Fumigating with «tick plant» (?) is very effective.

It is not possible to understand his discussion of the next three diseases. For a second time ibn al- Awwam deals with leeches in the oesophagus. A few words are devoted to the ointments, pitch and olive oil being used most often.

Some skin troubles including cancer (?) are dealt with. Ekele (cancer ?) is a very serious disease and kills the sick animal or man slowly but surely. Cauterisation can be used in man.

Cold abscesses should be opened, warts are to be cut if possible. The wounds made with swords are treated with honey and rhubarb. If a wound bleeds too much it is dangerous. Bites of snakes and scorpions dealt with. I think all Arabic works deal with these bites because of the climate.

The last disease which ibn al- Awwam mentions is not understandable. Next he deals with the purgatives. He prepares a purgative with dog meat. After killing a puppy and cleaning the internal organs it is boiled with wine, honey and natrium bicarbonate. It must be boiled until the meat become soft. This bouillon must be given to the animal for three days. If the puppy is not easily available thigh of a fat pig can be used instead. (I have met this in later Arabic and Turkish works). But ibn al- Awwam never uses disgusting animal excrement as remedies. In the spring he recommends enema for three days with honey and water or with egg white, pitch leaves decoction, oil and water.

Thirty fourth chapter. This chapter deals with the pigeons, ducks, peacock, and hen; poultry raising, feeding, and their diseases and cures.

He says, there are two kinds of pigeons (domesticated and wild). He deals with domesticated pigeons. In Egypt they lay eggs twelve times in a year and each time two and sometimes three eggs are laid. One hatches male and the other female. If the egg is pointed this is an omen for a female; if rounded for a male pigeon. Incubation period is 20 days. The pigeon sits on the eggs during the day and the female at night. The best hatching time is spring. Winter or summer are not suitable seasons. Wild pigeons usually lay eggs twice a year. Pigeon houses should have three holes; one of them is bigger and used as a door. It must face south.

Lentils, barley, kidney beans, tare and wheat are good foods for pigeons. He says pigeons are delicate and can be ill easily. By nature they are dry and hot. Here we meet Galenik theory.

Some diseases of pigeons like infectious bronchitis (?), or fowl-pox (?), aspergillus (?) and synovitis are mentioned. Pigeon lice and their treatments are described. In case of less egg laying he recommends to feed hens with noodle and garlic.

He writes that the peacock is a pet animal; it can live as long as 25 years. At the end of the third year it begins to lay eggs and the

plumage is completed. They mate in the spring time. The female lays 12 eggs and incubation period is 30 days.

Goose raising is also mentioned; its incubation period is 30 days. Their food must be free of hair and wool. Incubation period in birds as the eagle, the woodcock and the falcon is 25 days.

The duck lays twelve eggs thrice a year. Incubation period is 25 (?) days. Wetted barley and fresh leaves are suitable food for them although mustard is not.

For poultry production the breeding hen should have a big head, long legs, large eggs, big and very red comb (crest) and thick feathers. The best period for egg laying is the first year of age until the second year. Large hens lay more eggs than small ones.

The cock should have a round comb, strong legs, very hard nails and a thick tail. The hen and cock must be kept in a warm place. The nest should be rather high and contain some straw. Fifty chickens can be kept in one coop. There should be one cock for ten hens. With the exception of two months in the winter hens usually lay eggs all year round. Eggs from hens which are kept separate from cocks do not hatch. For better hatching he recommends food high in iron.

There are some superstitious notes about hatching time. But again he says February is the best time. Approximately 15 eggs are enough for a hen. Every three days the eggs should be turned. On the fourth day when they are held between the eye and the sun and looked at some red fibers can be seen. If these are not seen the eggs will not hatch. Gentle handling does not harm the eggs. In the winter the incubation period is 25 days and in summer 18 days. Ibn al-Awwam's suggestion on the incubation period in winter is correct but not in summer. Ibn al-Awwam tells us that eggs can be hatched artificially by keeping them warm in garbage or in manure and he adds that Egyptians used this method in ancient times.

Millet, wheat bran (scurf) and barley are good for poultry.

Poultry lice are mentioned; he says the type around the neck disturbs the animal very much. A mixture of myrtle seed and wine is a good remedy for lice. Ground porcelain is given with food to increase the size of the eggs.

There are some notes on the preservation of eggs. Castration of the young cocks is recommended for better meat. The last paragraph of the book gives interpreter's name and the date the translation was made.

After studying this translation I believe the translator was not a veterinarian. He was very poorly informed on the subject. This made

it very difficult to understand the book. That is why I have a feeling that sometimes misinterpreted of ibn al- Awwam's ideas.

According to Smith (6) ibn al- Awwam's book appears to be without doubt the most remarkable work of its kind produced during the twelfth century.

Smithcors (7) states that a book on Agriculture produced in Seville in the 12th century deals to a large extent with veterinary matters suggesting that at this time the profession of veterinary medicine, which already been divorced from its parent discipline, had become allied to agriculture.

According to Brockelman (1) Kitab al- Filâha deals with agriculture. Sources are Greek and ibn al- Awwam's own experience.

Froehner (2) has made a study on kitab al- Filâha's French translation. He states that ibn al- Awwam depends on Greek, Roman, Arabic works as well as his own experience and the experience of farmers. Lenclainche (3) gives a summary of this study.

Sans Egana (3) also made a study which I was not able to consult.

According to Sarton (5) Abu Zakariya Yahya ibn Muhammed ibn al- Awwam al Ishbili, was a Hispano Muslim agriculturist who lived at Seville about the end of the twelfth century. He wrote a treatise on agriculture, Kitab al falâha, which is the most important Muslim work as well as the most important mediaeval one on the subject; it is divided into thirty four chapters, of which the first thirty deal with agriculture proper, and the last four with cattle and poultry raising and apiculture.

In spite of Sarton's information, in the Turkish translation I did not find any notes about apiculture; nor did' Froehner (2) mention this in his study.

In conclusion ibn al- Awwam's book was a very important work; the most important of the twelfth century. The last four chapters are on veterinary medicine and animal breeding. Ibn al- Awwam was well informed on animal breeding, conformation and hygiene. Some contagious diseases are mentioned by him and many foot diseases are described. He gives quite a good information on poultry raising. He is very rarely superstitious.

### S U M M A R Y

In this article veterinary part of Ibn al-Awwan's book discussed. It is written in the twelfth century. The last four chapters are on veterinary medicine and animal breeding. Ibn al-Awwam was well

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### Ö Z E T

Bu çalışma ile çok kıymetli bir kopyesi İstanbul Beyazıt Umumi Kütüphanesinde bulunan, 12 inci yüzyıla ait bir eserin veterinerliğe ayrılmış olan bölümlerinin kritik incelemesi yapılmıştır.

Kitap İslâm bilgini İbnül'avvâm tarafından yazılmış, 1590 da Türkçeye çevrilmiştir. Hayvancılık ve hayvan hastalıkları kısmı dört bölümde anlatılmıştır.

Birinci bölümde sığır, koyun ve keçilerin gebelik süreleri, hastalıkları ve tedavilerinden; ikinci bölümde at, eşek ve develerin çiftleşme zamanları, gebelik süreleri, yemlenmeleri ve kötü huylarının giderilmesinden; üçüncü bölümde atların hastalıklarından ve tedavilerinden ve dördüncü bölümde ise güvercin, ördek, tavus kuşu, tavuk yetiştiriciliği, beslenmeleri, hastalıkları ve tedavilerinden bahsedilmektedir.

İbnül'avvâm'ın hayvan yetiştiriciliği, hastalıkları ve tedavileri konusunda doğru bilgi sahibi olduğu görülür. Bilhassa sağlık koruma tedbirleri çok iyidir. Eserde bazı hastalıkların bulaşıcı tabiatına işaret edilmiş ve birçok ayak hastalıklarından bahsedilmiştir. Yazar çok nadiren batıl itikatlara inanır.

Kitab al- Falâha 12 inci yüzyılın ziraat ve veterinerlik konusunda en önemli eseri olarak kabul edilmektedir.

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