



Progress Report on Provision of Ring Vaccination for Blackleg in Cattle for Communities Surrounding Wollega Univeristy, Horro Guduru Animal Research and Genetic Conservation Centre



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Introduction

Ethiopia is one of the countries with the largest number of livestock in Africa and livestock production plays a major role in the development of Ethiopia's agriculture. Ethiopian livestock population is estimated to be 59.49 million cattle, 30.697 million sheep, 30.200 million goats, 8 million donkey, 2.16 million horse, 1.20 million camels, 0.4 million mules and 59.495 million poultry [1]. Nevertheless, the development of livestock sector in Ethiopia is hindered by widespread endemic health problems including bacterial diseases, viral diseases, and parasitic infestation [2]. Animal diseases such as blacklegs, which are also production or black quarter cause major limitations to the livestock agriculture of the country and affect livelihood through their effect on animal health and impact on the production. Blackleg also called quarter ill or black quarter is an acute specific infectious disease of cattle, sometimes of sheep and pigs characterized by the presence of rapidly increasing swellings containing gas, and occurring in the region of the shoulder, neck, thigh, quarter, and sometimes in the diaphragm. Young cattle between the ages of 6 months and 2 years are also susceptible [3].

The disease is acute myositis caused by the activation of latent intramuscular *Clostridium chauvoei* spores. It commonly kills unvaccinated cattle between 3 months and two years of age especially in higher rainfall areas such as the coast of north southwest. It is an endogenous acute infection that principally

affects cattle. The disease is caused by *Clostridium chauvoei* (*C. chauvoei*), an anaerobic spore forming bacterium. Blackleg usually commences in skeletal muscles but occasionally the heart or diaphragm is affected. The primary site of infection of blackleg was myocardium [4]. Blackleg is caused by the spore forming, rod shaped, gas producing bacteria *Clostridium chauvoei*. The spores of the organisms can live in the soil for many years. The bacteria enter the host by ingestion and then gains entrance to the body through small punctures in the mucous membrane of the digestive tract. Cattle that are on a high plane of nutrition, rapidly gaining weight and between 6 months and 2 years of age are most susceptible to disease. The disease is not transmitted directly from sick animals to healthy animals by contact [3]. Bacterial spores are eaten in contaminated feed or soil. The spores then enter the bloodstream and lodge in various organs and tissues, including muscles. The injury reduces load flow to the area, thereby reducing the supply of oxygen to tissues. In the absence of oxygen, the spores germinate and multiply. As they grow, the bacteria produce toxins which destroy surrounding tissues. The toxins are absorbed into the animals' blood stream which makes the animal acutely sick and causes rapid death [5].

The first signs observed are usually lameness; loss of appetite, rapid breathing and the animal is usually depressed and has a high fever, characteristic swellings develop in the hip, shoulder,

chest, back, neck or elsewhere. First the swelling is small, hot, and painful. As the disease progresses, the swelling enlarges and becomes spongy and gaseous. If the swelling is pressed, gas can be felt under the skin. The animal usually died within 12 to 48 hours. In most cases the animal is found dead without being previously observed sick. Pathological changes associated which blackleg are the carcass bloats and putrefies quickly after death, body cavity often contain excess fluid, often reddish in color, infected muscle masses are swollen, discolored and have a foul odor; in some cases a small muscle mass will be affected, and lesions may be hard to find. Sporulated gram positive rods can be demonstrated in smears of infected tissues and identified by immune fluorescent reagent. ground muscle in saline is cultured on blood agar plates, which are incubated anaerobically, because of the possible presence of swarming *Cl. septicum*, early subcultures should be attempted from some plates, which others last for 48 hours most the organism will appear as gram positive rods when examined immediately following death of the animal [6].

Treatment of affected animals with penicillin is logical if the animal is not moribund but results are generally fair because of the lesion. Large doses should be administered commencing with crystalline penicillin intravenously and followed by longer acting preparation, some of which should be given in to the affected issue if it is accessible. The most effective means of prevention is proper vaccination program. Multivalent vaccine is suggested. The first dose should be given at two months of age and a second injection at either four weeks before preweaning or at the time of weaning. If animals are in an endemic area, another booster should be given [7]. In the event of an outbreak, individuals between 6 months and 2 years should be vaccinated or revaccinated. A two-week period post vaccination exists during which antibody levels are not high enough to our resistance and animals may continue to be loss. Moving animals away from the site of contamination is desired but even this is not always effective. Carcasses of animals known to have died from blackleg should be not opened. Opening the carcass can liberate bacteria which form spores that contaminate the ground and subsequently infect other cattle [8]. Blackleg is a cause of severe financial loss to cattle raisers in many parts of the world. Outbreaks still occur occasionally in vaccinated herds but more frequently in herds where vaccination has been neglected [6].

Similarly, However, Guduru Woreda was rich in cattle population; it is difficult to vaccinate the whole cattle by the Woreda Livestock and Fisheries Resources Development Office alone. For example, last year the outbreak of blackleg disease occurred in Guduru woreda and large numbers of community's cattle which are estimated to 1150 cattle were lost due to this infection. This highly harmed the financial economy of the community as well as the country. Therefore, this community service was interested in helping the community on the prevention of blackleg disease occurrence in Guduru woreda of three kebeles surrounding

Wollega University Horoguduru Animal Research and Genetic Conservation Centre.

Specific objectives of the project

The specific objectives of this service were:

- To prevent the occurrence of blackleg disease in cattle in selected areas.
- To improve the health and welfare of cattle found in the selected areas.
- To prevent the transmission of blackleg disease to the cattle found in the Wollega University Horoguduru Animal Research and Genetic Conservation Centre.
- To reduce the need for antibiotics to treat and manage the animals going to be exposed to the blackleg infection.

Implementation Methodology

After the vaccine was purchased, we called very important persons from the three kebeles and from the Guduru woreda livestock and fisheries resource development office which were thirteen (13) in number and discussed on the implementation strategies of giving vaccine. This meeting officially began on October 28, 2020, and continued for three days on the other major activities needed. The discussion consists of presentation on the epidemiology, prevention and control strategies of the blackleg diseases, day when vaccination will be started, how to prepare cattle crush and on the mobilization of the community. From this discussion we agreed on that, proper vaccination program is the most effective means of prevention for the blackleg disease. After we had discussed the first day, on the last two days the mobilizing committees entered the community and informed them about the importance of this service. These committees have tried to address the information almost all to the three kebeles community. Then the communities were convinced, and they have prepared three (3) cattle crushes at each of the three kebele whereas nine (9) crush was prepared totally. After the preparation of cattle crush, veterinary team of the Wollega University, horo Guduru animal research and genetic conservation center were arrived at the prepared crush and gave vaccine to the community's cattle surrounding the center for ten (10) days from October 31, 2020, to November 9, 2020. During vaccination program the mobilizing and awareness committees were participated on the activity as a facilitator till the vaccination was finished.

(Figure 1, 2, 3)

Beneficiaries

This community service was delivered at the three kebeles (Gudane kobo, gudane sirba and waljelachisa sirba) of Guduru district. The local communities of the three kebeles total 429 (four hundred twenty-nine) households benefited from this service.

However, we have planned to vaccinate 10,000 cattle, but only 9,000 (nine thousand) cattle were vaccinated. This was because of that the number of cattle arrived at the vaccination place were only 9,000 cattle. Our plan was successfully accomplished due to

the mobilizing committees having been aware of the communities effectively and efficiently. Kebeles, the number of households benefited, and number of cattle vaccinated were shown in the table below (Table 1).



Figure 1: vaccination of blackleg vaccine in cattle at gudane sirba kebele.



Figure 2: vaccination of blackleg vaccine at waljalachisa sirba.

Table 1: Kebele, number of household and number of cattle vaccinated.

S/n	Kebele	No. of household	No. of cattle
1	Gudane sirba	153	3300
2	Gudane kobo	136	2500
3	Waljalachisa sirba	140	3200
Total		429	9,000

Impact Analysis

By delivering this service its impact on the community as well as on the concerned sector of the woreda were attached at the back of this report paper as feedback and appreciation style. This feedback was one of the results that we expected as output before

delivering this service.

Fund Utilization

The total fund allowed for us to conduct this service was 63,413 ETB. From this fund 56,900 ETB was utilized and 6,513 ETB was returned to the finance (Table 2 & Table 3).



Figure 3: vaccination of blackleg vaccine at Gudane Kobo.

Table 2: Vaccine cost.

Items	Unit	Quantity	Unit Price	Money received	Money utilized	Balance
Blackleg vaccine	dose	9,000	1.5birr	20,000	13,500	6500

Table 3: Per-diem and Transports Costs.

Perduim	Quantity	Money received	Money expended	Balance
1. Vet. technician during vaccination	-	-	-	-
1.1. team leader	1	3630	3630	0
1.2. Vet. assistant	3	9030	9030	0
2. procurement of vaccine	2	7240	7240	0
3. Awareness and training	-	-	-	-
3.1. development workers	6	6534	6534	0
3.2. PA managers +chairpersons	6	6534	5580	954
3.3. SMSs	5	5445	4887	558
4. fuel	-	5,000	4994	6
5. report submission	1	-	1505	-1505
Subtotal		43,413	43,400	13
Total		63,413	56,900	6513

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