Rural Poultry Centre Malawi

PO Box 81
Likuni
Malawi
Tel: +265 (0)995943034
Email: rpc@ruralpoultrymalawi.org
Web: http://www.ruralpoultrymalawi.org

Vaccination Services for Rural Poultry in Malawi

Background

The Malawi Ministry of Agriculture, Irrigation and Water Development, through the Department of Animal Health and Livestock Development (DAHLD), works together with donors, NGOs and other stakeholders to provide vaccination services for the control of Newcastle disease (ND) in rural poultry.

With funding and support from the Australian government, it established a vaccine production unit (VPU) for the I-2 Newcastle disease vaccine in 2005 and continues to operate the unit within the Central Veterinary Laboratory (CVL) in Lilongwe. This is the only poultry vaccine manufactured in Malawi. Vaccines against other poultry diseases are used in commercial poultry but not generally in the rural poultry sector.

Purpose

This paper seeks to present an overview of the current situation as regards vaccination of rural poultry, to identify constraints, risks, and opportunities, and to look forward over the next few years to assess likely needs and options for development. It takes particular cognisance of trends towards commercialisation in the rural poultry industry.

Commercial poultry

In Malawi, vaccination services for commercial poultry are generally adequate to meet demand. Large operators import or purchase locally all required vaccines. For small and medium enterprises, veterinary outlets market a range of suitable vaccines. Many small commercial operators lack sufficient knowledge and expertise to adequately protect their flocks but there is a growing network of groups and fora operating through social networks to assist such people.

Village poultry

Village poultry[1] are typically those which are kept in small numbers and rely heavily on scavenging for their feed requirements. In this sector, vaccination is the exception rather than the norm. The major disease threat for village poultry is Newcastle disease (ND) which tends to come in localised epidemics about once to thrice each year and cause mortalities of up to 90% or more. Another significant cause of loss is predation, accidents and theft. Disease conditions other than Newcastle disease are the next most significant source of loss.

Estimates of the national population of village chickens vary widely and census data may not reflect the whole picture. However, there are reasonably consistent estimates to be derived indirectly. The actual population is probably about 25-30m village chickens[2].

1 Village poultry (as distinct from small scale commercial poultry) are typically owned by people from a wide span of the poverty spectrum. In the village, it can be expected that people at the lower end may well still own a chicken. This contrasts with other classes of livestock where poverty is more closely linked with livestock ownership.

2 There are about 3.4m households in rural Malawi and about 60% ie 2.0m own chickens. The average number of chickens per chicken owning household in several surveys was found to be about 10-14.

The I-2 Newcastle Disease Vaccine

Vaccine usage in village poultry is minimal. The most commonly used vaccine in this sector is undoubtedly the I-2 ND vaccine originating from CVL in Lilongwe. Other vaccines used for control of ND include a formulation of La Sota ND vaccine which, like I-2, is applied by eye drop. Occasionally efforts are made to use 'commercial ND vaccines'[3] in village poultry but the results are not generally good enough to impress poultry owners nor to motivate them to continue to vaccinate in future.

The I-2 vaccine was specifically designed for use in village chickens. The attributes which make I-2 well suited for village use, compared to 'commercial ND vaccines', include:

- Thermostability - it remains stable at room temperature for a period from 3 days to 3 weeks depending on ambient conditions; this is important given the lack of refrigeration facilities in rural areas;
- Simplicity of use by community based vaccinators - the formulation is in a ready-to-use plastic eye-dropper bottle;
- Safety - it has no adverse effects in chickens of any age.

Rural communities recognise that the I-2 vaccine is effective. In villages where vaccination has been newly started, poultry owners see the effect and call for more vaccine (at full cost) when they feel their poultry are again at risk.

I-2 Vaccine Production, Distribution, Supply & Demand

The I-2 vaccine is produced at one location in Malawi, the Central Veterinary Laboratory (CVL) in Lilongwe. This facility began production in 2005 and has gradually increased its production capacity since then, but never at a rate which fully satisfied demand. The production facility is managed under DAHLD and all staff are directly employed by government.

The I-2 vaccine is made available by government at CVL and no other location. However the vaccine is often transported to other centres from which it is distributed. This is generally done by individuals, NGOs, project staff, or government field staff (doing so on a private rather than an official basis). The topic of formal distribution via Regional Laboratories, Agricultural Development Divisions or District offices has been discussed on numerous occasions over the years but no distribution network has been established to date. A recommendation dating from 2011 for establishment of a "Marketing and Distribution Unit" for I-2 has not been adopted.

Supply of the I-2 vaccine is chronically insufficient to fully meet demand. The chronic difficulties in obtaining vaccine result in a loss of morale and motivation on the part of users, community based vaccinators, and veterinary outlets. After repeated disappointments, they either revert to alternative less suitable products or lose the incentive to continue.

Demand for I-2 is relatively level from month to month but there is a distinct mid-year surge due to external factors. For the three years to 2018, there have been significant shortages of vaccine at this peak period. The quantity of vaccine on hand at the vaccine production unit is virtually never more than sufficient for one week, which results in frequent periods of non-availability. Given that the shelf life of the vaccine is four months, a minimal stock of at least several weeks supply would appear appropriate and practicable.

A major ongoing risk associated with the current I-2 vaccine production unit has been the location of the VPU within the main diagnostic building of CVL. This location is quite unsuitable. For production of any vaccine, a clean pristine environment is key. The environment of a diagnostic laboratory where veterinary diagnostic specimens, live or dead animals for post mortem examination, or other contaminated materials are in transit, is anything but pristine. Losses of batches of vaccine through contamination, possibly as a

3 In this context, "commercial ND vaccines" refers to vaccines which are manufactured for use in commercial poultry which are housed full time in a situation where vaccine can be effectively distributed throughout the flock, usually via water or coarse spray.

result of the unsuitable location, have been a significant problem at times. In recent months, DAHLD has taken action to solve this problem through rehabilitation of a separate building within the CVL premises but away from the main diagnostic laboratory. Arrangements have been made through donors for procurement of equipment necessary for the operation of the new facility and it is hoped that it will be in operation by the end of 2019. This development will hopefully reduce the risk of contamination and hopefully enable an increased production of I-2 sufficient to meet demand.

While the new facility will be an undoubted improvement, whether it will solve the chronic inability to meet demand for vaccine remains in doubt. The current facility has always had the capacity to expand production (without major structural or staffing changes) and has gradually increased production every year. Nonetheless, chronic failure to meet demand has been an ongoing problem every year. It thus appears that the chronic inability to meet demand is not a function of insufficient infrastructure or staff.

On many occasions when problems affecting production were foreseen, it was outside institutions such as the Rural Poultry Centre, Inter-Aide, or BASEDA (Basic Services Development Agency) which came to the rescue in order to ensure continued production. For a variety of reasons, government did not have the wherewithal to take urgent action, especially in regard to procurement, in order to forestall interruptions to production.

A large factor in this inability to respond quickly has to do with the financial systems within which Malawi government departments are required to operate. It is not possible to quickly release funds in response to unforeseen circumstances. Linked to this is the absence of any separate ledger covering financial transactions pertaining to the vaccine production unit. Income from the sales of vaccine is aggregated together with other larger sources of funds in the "livestock account". DAHLD is permitted to expend some 95% of this income but this is subject to the normal government financial prodedures. Importantly, it is also subject to the shifting DAHLD priorities for expenditure from the livestock account. These priorities cover not just the VPU but also a wide range of other DAHLD programs, many of which in actuality, take precedence over the VPU.

There is no reason to believe that this situation will change solely because the physical VPU facility has been relocated and upgraded.

The reasons for inadequate supply of vaccine include:

- No distribution points outside Lilongwe have been established;
- No designated 'marketing and distribution unit' nor strategy has been established;
- There is no means to 'quarantine' the income from vaccine sales for use in maintenance and operational costs of the VPU; indeed there is no separate ledger to separately identify those funds;
- There is no mechanism to release funds at short notice for unforeseen emergencies which threaten production;
- There is excessive reliance on outside sources of assistance, even for routine consumables such as vaccine dropper bottles;
- There is no corporate policy on ways to ensure a balance of supply vs demand; for instance, there is no minimal target quantity of vaccine stock which must be on hand at any time.

The need for increased vaccination services for rural poultry is clear. The total population of village chickens is currently about 25-30m. Ideally, chickens should be vaccinated three times each year. Contrasted to this is production of the I-2 vaccine which last year reached about 9m doses. Certainly, yearly vaccine production is still increasing but a huge proportion of chickens do not get vaccinated. That gap will not be filled immediately - there needs to be logistical improvements such as training of vaccinators, supply chains for the vaccine, promotion and education. These things cannot happen overnight. The entire system must be demand driven but supply must be reasonably capable of meeting that demand.

Development needs

Newcastle disease vaccination

There has been recent interest in the commercialisation of production and marketing of village poultry. This cannot happen unless vaccination against Newcastle disease in particular is much more widely adopted. The model for production, distribution and promotion of the I-2 vaccine needs to adapt to meet these medium term needs.

Another Newcastle disease vaccine promoted for village poultry has recently made an entry into Malawi and is starting to take up a significant portion of the market for ND vaccination in rural poultry, possibly up to 2m doses per annum. The vaccine is a 'La Sota' strain which like I-2, is delivered by eye drop. This vaccine is marketed by Hester Biosciences, a company based in India via a Malawi veterinary supplier, Ziweto Enterprises. This vaccine has not been subject to intensive local evaluation and its overall suitability for the village poultry sector is not known. Importation and marketing of the Hester vaccine (instead of the locally available I-2) by Ziweto was initiated solely because of the unreliable supply of I-2. Other institutions such as NGOs have similarly had to modify their preferred business model to accommodate irregular supply of the I-2 vaccine.

I-2 Newcastle disease vaccine is also manufactured in Tanzania. Occasionally, the Tanzanian vaccine, which is not licensed for sale in Malawi, has been found on the shelves of veterinary outlets within Malawi, presumably because those outlets were unable to obtain the vaccine from the VPU in Lilongwe.

Other vaccines

Experience both in Malawi and in neighbouring countries has been that once communities succeed in controlling Newcastle disease, farmers notice other poultry diseases which have hitherto been 'masked' by the more damaging effects of Newcastle disease. Some of these diseases such as fowl pox are also best controlled through vaccination. Development of systems to enable rural poultry producers access to such vaccines should be seen as a secondary priority after the aforementioned matters.

Possible Solutions

Some (non-exclusive) actions which aim to meet the likely medium term needs of the village poultry sector for vaccination against ND and other diseases include the following:

1. Change the management model of the government-run I-2 VPU:
    a) Design a public/private partnership (PPP) under which the facility would remain the property of the government but operation, management, distribution and vaccine marketing are the responsibility of a partner contracted to meet specified minimum standards and targets.
    b) Establish a semi-government authority to manage the entire facility. The standards and requirements would need to be established or confirmed, documented and agreed before such an arrangement could be put in place.
2. Promote the development of an entirely private VPU for an I-2 vaccine, either in addition to or as an alternative to the present CVL facility.
    a) This should include an effort to analyse and address any equity issues including subsidisation and competition with any existing government owned facility.
    b) The facility would require assessment and approval by the Pharmacy, Medicines and Poisons Board of Malawi in regard to standards of construction and production.
3. Review and assess the efficacy and safety of the Hester Biosciences ND vaccine under local conditions to assess its suitability for possible promotion and wider use. This should take into account any research or trials already assessed by the Pharmacy, Medicines and Poisons Board of

Malawi. It should also apply to any other Newcastle disease vaccines which are approved for importation.

4. Design and conduct research and development strategies for poultry health to address the medium-term needs of rural poultry owners in the scenario where ND is under adequate control.

Conclusions

A Public/Private Partnership for I-2 Production

The management model for the existing I-2 vaccine production unit needs to be reviewed and restructured to ensure production levels adequate to meet current needs and anticipated future trends. The public/private partnership model (Option 1a) would seem to be inherently suited to this situation. A PPP model which overcame the capacity failures to date could be developed through a collaborative and consultative process involving all stakeholders. The private aspects of this model would address production and supply of vaccine while the public aspects would address public interests as well as development goals. The establishment of a partnership should be contingent upon the new VPU being fully capable of operation and should be subject to potential renewal after a stipulated period.

The PPP would be the preferred initial option, while Option 2, to promote the development of an entirely private VPU for an I-2 vaccine, would be a fallback position in the event that a PPP were failing the achieve its objectives.

Alternative Newcastle disease vaccines

There is currently insufficient publicly available information to assess the suitability of the Hester Biosciences ND vaccine. Yet such an assessment needs to be made, especially in respect of a vaccine which is primarily used in rural poultry. Responsible institutions would include the Pharmacy, Medicines and Poisons Board as well as DAHLD.

Research and development strategies

As more rural areas bring Newcastle disease under good levels of control, and farmers' needs trend towards other priorities, the demand for solutions to new problems will emerge. Institutions such as DAHLD, academia, NGOs and other stakeholders should consult and develop priorities for R&D aimed at overcoming impediments and addressing newly recognised diseases.

Next Steps

These suggestions and recommendations should be considered in a consultative manner in order to plan the way forward in order to best serve the interests of the rural poultry sector. Consultation should involve all relevant stakeholders including government, NGOs, donors, poultry industry representatives, veterinary suppliers, vaccine users, and other institutions with an interest such as farmer organisations.

_____

Pat Boland
Director, RPC.
20 November 2019