Animal health scenario in India

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Animal health plays an important role in harnessing the expected productivity performance of dairy animals. In India, with limited feed resources and inferior genetic makeup of a sizeable number of bovines already dogging the sector, a further decline in productivity due to poor health of these animals only adds to the woes of the farmer, which does not augur well for the dairy industry. The main impetus of National Dairy Plan (NDP) is to increase the productivity of dairy animals through multipronged strategies of improving genetics, widening AI coverage and promoting scientific feeding practices which may not have the desired affect if not juxtaposed with better health care and augmented by appropriate disease control programmes.

The animal health institutions of our country have strived relentlessly for decades before being recognized as a country free from CBPP by the OIE. The contribution of the Indian veterinary fraternity in global eradication of Rinderpest is also a matter of pride. The swift and proactive actions taken by the veterinary institutions from time to time in squelching Highly Pathogenic Avian Influenza (HPAI) are also laudable.

The country has one Central and five Regional Disease Diagnostic Laboratories to provide referral diagnostic services, as per the disease diagnostic network set-up by the Government of India. The Centre for Animal Disease Research and Diagnosis (CADRAD) of IVRI, Izatnagar functions as the Central Laboratory. The Regional Laboratories are located in Kolkata (Eastern), Pune (Western), Jallandhar (Northern), Bengaluru (Southern) and Guwahati (North-eastern). The networking of these laboratories with other laboratories of the State Governments, ICAR and Universities have also been initiated for better coordination and efficient disease diagnosis, monitoring and reporting.

A High Security Animal Disease Diagnostic Laboratory (HSADL) with biosecurity level 4 (BSL-4) has also been established with state-of-art facilities at Bhopal and is the OIE-recognized reference laboratory for avian influenza.
More BSL-3 laboratories are being established at Bangalore, Pune, Guwahati and Bareilly. The existing 23 State level animal disease diagnostic laboratories are also in the process of being upgraded to BSL-2. However, non-availability of standardized diagnostic kits for many diseases and non-existence of laboratory accreditation, essential for ensuring rapid, accurate and reliable diagnosis are still a problem.
The Animal Quarantine and Certification Services (AQCS) offices located in New Delhi, Mumbai, Chennai & Kolkota also deserves a mention for the valuable services being provided during import and export of animals and animal products.
The country is mostly self-sufficient in vaccines and therapeutics for most of the diseases. However, with the government launching national programmes for control of Foot and Mouth disease (FMD), Bovine brucellosis and Peste des Petits Ruminants (PPR), the future requirement for various vaccines is expected to go up manifold.

The enactment of Prevention and Control of Infectious and Contagious Diseases in Animals Act in 2009, and subsequent framing of Rules (Prevention and Control of Infectious and Contagious Diseases in Animals Rules, 2010) by the central government are expected to provide a salubrious legal framework for implementation of any disease control programme in the country. The rule empowers the government machinery for compulsory vaccination, disease reporting, movement control and quarantine of animals among other things.

While the progress made so far has been encouraging, in order to elevate the animal health delivery mechanisms in our country to international standards, a lot more needs to be done. For this, putting in place better systems and standards would be the starting point. This would imply a plethora of activities to be carried out, foremost being upgrading the infrastructure, both in terms of

number of veterinary institutions - hospitals, colleges, diagnostic laboratories and vaccine production units etc, and quality of the services they deliver, so that it ultimately culminates in good quality veterinary services being provided at affordable rates at the farmer's doorstep, especially for large animals. Veterinarians passing out of colleges should also be provided with continuing veterinary education to keep them updated on various animal health issues.

While there is no gainsaying the fact that an adequately trained veterinarian would be a boon to the farmer, it is also equally important to note that unless there is a general awareness on various animal health issues among the farmers, they would be unable to differentiate the services provided by a qualified veterinarian or an untrained person/quack. For ensuring this differentiation, extension and creation of awareness among farmers has to be the core component in any activity that is planned.

There are quite a few diseases that could compromise the profitability of milk business. The more important of these that require attention at a national level are Foot & Mouth Disease (FMD), Haemorrhagic Septicaemia (HS), Black Quarter (BQ), infertility and parasitism. The government veterinary machinery needs to reorient itself to focus more on preventive health care and control, containment and eventual eradication of economically important diseases. This entails skill development and infrastructure building in epidemiology (surveillance, monitoring, risk analysis, statistical analysis and disease forecasting). There are many emerging diseases such as Infectious Bovine Rhinotracheitis (IBR) and Bluetongue that are gaining prominence and have by now spread almost throughout the country. We need to develop efficient tools and technologies to manage these diseases.

Food security is also increasingly gaining the attention when animal and its products are being discussed. Absence of harmful bacteria, antibiotic and other drug residues, hormones etc are some of the major concerns that are being raised while broaching the subject.

Animal welfare is another aspect that is fast gaining importance in today's market driven economy. The present consumers, especially urban, also want to be informed about the conditions in which the animals, whose milk they consume, are being kept.

Improving infrastructure

There are presently around 31363 Veterinary Institutes (VIs) (vet. hospitals, polyclinics & dispensaries) in the country (DADF, 2012-13). The National Commission on Agriculture (NAC) has recommended one veterinarian for every 5000 animals. It is therefore imperative that the numbers of VIs are increased and at the same time, facilities at the existing VIs are improved, which, more often than not are found lacking even in the basic amenities.

Increasing the VIs would lead to increase in the requirement of veterinarians. Presently there are 35 veterinary colleges in India. There is an urgent need to increase the number of teaching institutes providing quality education to meet the increasing demand of vets in the country.

Adding to this shortage, most of the present veterinarians do not have access to even simple diagnostic facilities, nor are they provided with opportunities to upgrade their skills. As a result, the treatment offered by the qualified veterinarians is mostly empirical and the quality is at times only marginally better than that of a para-vet or a quack. When unavailability of quality services is compounded with information asymmetry due to poor awareness among the farmers, the farmer is unable to distinguish between high (veterinarian) and low quality service providers (quack) and the scale tips in favour of low quality service providers since they offer their services at a low price. Therefore, proper awareness creation among animal owners would be the bedrock for the success of any programme to be implemented in animal health.

The existing VIs in the country are supported only by a meagre 250 diagnostic laboratories (DADF, 2012-13). The laboratory support base to the VIs needs to

be increased considerably to improve the quality of veterinary services being provided. Better strategies also need to be evolved for the institutes involved in production of vaccines, diagnostics, reagents etc, so that the requirement, both in terms of quality & quantity are ensured.

Documentation and reporting is another area that requires urgent attention. Lack of proper information precludes the policy makers to formulate effective policies. Most of the disease reporting is still done manually which is usually incomplete and delayed. In many cases, by the time the reporting is done and control measures initiated, the disease may have already assumed devastating proportions, causing huge losses. To tackle the issue of reporting, the GoI plans to initiate a National Animal Disease Reporting System (NADRS), which would enable real time reporting by all stake holders using SMS or internet. This would also provide a veritable source of information for reporting disease occurrence to international agencies like OIE on a regular basis. However, there is still a requirement for documentation of activities like vaccination, deworming, treatment, disease testing etc which is done on a routine basis by the veterinarian and also record the movement of the animal (traceability). NDDB has developed a comprehensive software in collaboration with Infosys, the Information Network for Animal Productivity and Health (INAPH), which captures all the parameters for the abovementioned activities. The database thus created can be used to estimate the incidences of various diseases and also track the movement of animals, anywhere in the country. This rich repository of information would also help policy makers to formulate appropriate disease control strategies required in various regions of the country.

Control of economically important diseases

Though the list of economically important diseases in India is rather extensive, the majority of the losses are caused by a few major diseases, namely mastitis, FMD, HS, BQ, infertility, parasitism, Brucellosis, Leptospirosis and

Tuberculosis (TB). It is felt that controlling these diseases would substantially reduce the losses in dairying. Some of these diseases like Brucellosis, Leptospirosis & TB are also important due to their zoonotic nature.

Mastitis ranks high among the diseases that cause severe economic losses to the dairy farmers throughout the world. In India, the losses estimated due to mastitis (both clinical and subclinical) in 2001 was around Rs. 6100 crore per annum. Interestingly, it also showed that 70% of the losses (Rs. 4400 crore) were due to subclinical mastitis (SCM) (Dua, 2001). These losses may increase further with the increase in the number of high yielding animals.
Efforts to control clinical mastitis have been ongoing by emphasizing on timely treatment and clean milk production. But focus has been scant on SCM control in spite of the knowledge that farmers may not comprehend the existence of such a condition in their animals because there are no overt signs (Østerås, 2000).Though these cases seem innocuous initially, these could gradually turn pernicious and cause even more damage than a clinical case (Jahnke, 2004).

The level of antibiotics in milk is another serious problem that needs to be addressed. The most common inhibitory substances in milk are drug residues, especially those used for treatment of mastitis (Brouillet, 1992). Antibiotics used for mastitis treatment and during dry period accounted for around 70% of cases of milk residues. These antibiotic residues could lead to allergy, alter drug resistance and impaired quality of fermented milk products (Ram, 2000). Some studies in India have revealed high concentrations of antimicrobial residues in milk (Narayanan, 2001) (Dutta, 2001).

SCM prevalence in herds also reduces their milk production potential. It is reported that when the percentage of infected quarters increase from 6 - 48%, the Somatic Cell Count (SCC) in milk increases from 2 lakh to 15 lakh per ml and the milk production is reduced up to 29%,proportional to the SCC levels

(Council, 1996). All this occurs without any discernable changes in the udder or in milk.

With globalization being the rule of the day and newer markets opening up for milk and milk products in its wake, it is imperative for all stake holders yearning to join the fray that they conform to the Codex recommendations of on the parameters directly related to animal health. It is perhaps also possible that future regimes governing world and perhaps even domestic dairy trade would place severe restrictions on SCC and antibiotic residue levels in milk and milk products.

It is therefore important that holistic mastitis control programmes are designed and implemented to address the whole gamut of issues namely, SCM and CM, antibiotic residues and SCC levels, bacterial load in milk, and, most importantly, translate the same into simple executable modules so that the farmer is able to appreciate its benefits in terms of profitability and thereby willingly adopt these practices.

FMD is prevalent almost throughout the country, throughout the year, making it the most important disease for the country to control.

The annual losses due to the disease in the country is estimated at around Rs.140-Rs.200 billion (Longjam, 2011; TheDairySite, 2009; PTI, 2008; B Singh, 2013)

It is a highly contagious viral disease that affects cattle, buffalo, sheep, goat and pig. The disease has a significantly severe effect on the high yielding crossbred animals. FMD causes not only short term direct economic losses due to drop in milk yield, abortion and mortality of the young calves, but also indirect losses like loss of milk yield on a permanent basis and loss of breeding capacity. Presence of FMD also denies an opportunity to the farmers to earn more through international trade. After the advent of the WTO and with the removal of trade restrictions among the countries, it is likely that the sanitary

conditions related to livestock health could increasingly be used as non- tariff barriers by the importing countries.

Mass vaccination of all susceptible species (cattle, buffalo, sheep, goat & pig) biannually within a specified period of time is the most important component for controlling FMD. Along with this, proper animal identification, movement control of animals, feed and fodder etc. need to be carried out in a systematic manner. The GoI has been moving in the proper direction for control of FMD by implementing the FMD Control Programme (FMD-CP) in 221 districts in the country. However, focused and sustained efforts for a considerable period of time would be essential in order to achieve a disease free status for zone or region.

Diseases like HS & BQ, though not as rampant as FMD, also causes considerable losses due to its high mortality rates in various pockets of the country wherever it is prevalent. Timely annual vaccination in endemic areas is the only way to pre-empt losses due to these diseases.

Brucellosis is an important disease present in all livestock systems and is also zoonotic. Bovine brucellosis is a chronic infectious disease of cattle that causes abortions, the birth of weak or dead calves, infertility and, as a consequence, a 20-30% reduction in milk production (Enrique Herrera., 2008). The sero-prevalence of brucellosis in animals has risen from 8% in 1994-2004 to 21% in 2004-05 and 22% in 2005-06 (PD-ADMAS, 2005-6) .

The disease in humans can be insidious and may be present in many atypical forms. It is a significant public health problem in India, the magnitude of which is not known and is a neglected disease. It is present in all livestock systems and the increased demand for dairy products and intensified farming practices has raised the concern of increased spread and transmission to humans (Smits HL, 2005). Persistence of animal reservoir, low physician awareness, poor availability of diagnostic facilities, and the non existence of regional data bases contribute towards the perpetuation of zoonosis in India (Handa R, 1998).

Fewer than 10% of the human cases of brucellosis may be clinically recognized and treated or reported (Mantur B G, 2004).

The formulation of a control programme for brucellosis becomes all the more important considering the economic losses in livestock and the danger it poses to humans. Vaccines have been developed only for animals in which there is no cure for the disease. For the same reason, systematic vaccination of all female calves between 4-8 months of age once in its lifetime looks to be the most practical method to squelch the disease. The awareness of the farmers on proper handling & disposal of the abortus, handling & isolation of the infected animal, disinfection of the premises, drinking of milk only after boiling etc, will also go a long way in preventing the spread of infection. The GoI has formulated a National Control Programme on Brucellosis (NCPB) that envisages mass screening of cattle and buffalo to pinpoint the villages affected by brucellosis and further carry out vaccination programmes in such affected areas.

The economic losses associated with parasitism in cattle are universally accepted. Cattle with heavy worm loads have a low growth rate, delayed age at maturity, sub-normal milk yield and in most severe cases, cause death. All this severely dents the profitability of dairying due to delay in coming into production and also decrease in productivity. Cattle having subclinical parasitic burdens show no obvious signs of parasitism but cause significant losses in potential production.

A strategic deworming protocol needs to be put in place that strives not only to reduce the worm load in the animal, but also to reduce the worm egg load in the soil so as to minimize chances of re-infection. Towards this end, the mass and seasonal deworming concept needs to be popularized along with proper schedules for deworming of calves and pregnant cattle. Locale specific deworming protocols may also have to be developed for tapeworms and trematodes.While formulating such programmes, it is important that the

animals are not under-dosed or given the same drug repeatedly which would increase the chances of drug resistance developing in the parasites.

Infertility is another major cause of concern to the farmer. High incidences of repeat breeding have been reported from various parts of our country, with the farmer ultimately having to bear the losses of maintaining an unproductive animal. Focused efforts are therefore required in this direction to address the issue holistically. This would basically involve identifying such infertile animals and providing treatment. Adoption of scientific management practices like mass deworming, providing balanced ration, mineral mixture supplementation etc, in itself would help reducing infertility, mainly by reduction in age at first calving and calving interval, thus increasing the productive life of the animal.

While formulating programmes for disease control, it is of paramount importance that a suitable level of awareness is created among farmers so that they understand the necessity for it, especially when it involves interventions on their animal like vaccination, disease testing, isolation, removal from herd etc. Such education is also required for creating a conviction in them that by adopting scientific procedures, he stands to gain; sans these procedures, he stands to lose. Once this is done, the need for disease control would come up as a requirement from the farmer himself, and only then would a control strategy become tenable in the long run. In this is implicit that the foundation for the success of any control programme would be the support and participation of the State Veterinary Services in its design and implementation (Ashley, 1996).

Implementation of the Prevention and Control of Infectious and Contagious Diseases in Animals Rules, 2010 of the Central Government in earnest would be the best way out in ensuring that a disease control programme is effectively executed.

Food security and animal welfare

Veterinary drug residues in animal products, especially milk and meat, is something that requires serious contemplation. Though there are standards for withdrawal periods for various drugs before milk from the animal can be used, it is hardly followed in our country. The situation gets further aggravated due to indiscriminate use of antibiotics for therapeutics (as already elucidated above in the case of mastitis) and at times for prophylaxis, that could lead to a range of problems in the consumers like emergence of drug resistant strains of bacteria, cancer, allergy, reproductive disorders, hepatotoxicity etc (Nisha, 2008). This malady can only be dealt by strict implementation of the set standards, proper awareness creation and monitoring.

Keeping an animal comfortable by meeting its individual needs for nutrition, shelter, health, and avoidance of undue pain and suffering are the main concerns of animal welfare. It is also a known fact that keeping animals comfortable would have a positive effect on its milk production. The concept of animal welfare cannot be seen in isolation. It should form an integral part in all the animal husbandry programmes that are envisaged.

Bibliography

TheDairySite. (2009, July Tuesday). Retrieved from www.developmentalchannel.org/agriculture/agribusiness/2586

TheDairySite. (2009, July Tuesday). Retrieved from www.developmentalchannel.org/agriculture/agribusiness/2586

Ashley, S. H. (1996). *Changing role of veterinary services: A report of a survey of CVO's opinions. A report to OIE.*

B Singh, S. P. (2013). Estimation of economic losses due to foot and mouth disease in India. *Indian Journal of Animal Sciiences*, 83(9):964-970.

Brouillet, P. (1992). Inhibitory residues in Milk (foreign title). *Bulletin des G.T.V, No.4*, 11-35, 38-43.

Council, N. M. (1996).

DADF. (2012-13). Annual Report.

Dua, K. (2001). Incidence,Etiology and Estimated Economic Losses Due to Mastitis in Punjab and in India-An Update. *Indian Dairyman Vol.53.No.10*, 41-48.

Dutta, G. D. (2001). Antibiotic residues in milk after treatment of bovine mastitis. *Indian Journal of Dairy Science,Vol.54,No.6*, 322-325.

Enrique Herrera., G. P.-A. (2008). Milk Production Increase in a Dairy Farm under a Six-Year Brucellosis Control Program. *Animal Biodiversity and Emerging Diseases: Ann. N.Y. Acad. Sci.1149*, 296-299.

Handa R, S. S. (1998). Brucellosis in north India: results of a prospective study. *Journal of Communicable Diseases 30(2)*, 85-87.

Jahnke, B. (2004). Foreign title. *Neue Landwirtshaft*, 59-62.

Longjam, N. D. (2011). *Veterinary Medicine International*. Retrieved December 2011, from http://www.hindawi.com/journals/vmi/2011/905768/

Mantur B G, A. A. (2004). Childhood brucellosis- a microbiological, epidemiological and clinical study. *Journal of Tropical Pediatrics*, 50(3):153-7.

Narayanan, R. D. (2001). Qualitative and Quantitative detection of antibiotic residues in milk. *Cheiron.Vol.30,No.1/2*, 45-46.

Nisha, A. R. (2008). Antibiotic Residues- A Global Health Hazard. *Veterinary World,Vol.1 (12)*, 375-377.

Østerås, O. (2000). The cost of mastitis- an opportunity to gain more money. *Proceedings of British mastitis conference*, (pp. 67-77).

PD-ADMAS. (2005-6). *Annual Reports.* Bangalore.

PTI. (2008, April). *Livemint.com*. Retrieved January 2012, from http://www.livemint.com/2008/04/24123405/Foot-and-Mouth-disease-causes.html

Ram, C. (2000). Antibiotic residues in milk. *Indian Journal of Dairy and Biosciences,Vol.II*, 151-154.

Smits HL, K. S. (2005). Brucellosis in India: a deceptive infectious disease. *Indian Journal of Medical Research Nov;122(5)*, 375-384.