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P15M High Impact Projects

Approved for Livestock and Poultry RDE Network

For 2000-2001, the Livestock and Poultry Research and Development, Extension Network received P15 million for the implementation of seven high impact projects (HIPs).

The HIPs will be managed by the Institute of Animal Science and the Dairy Training Institute, both at the College of Agriculture in UP Los Baños. Leadership will be under Dr. Orville Bondoc, Dr. Jose Arceo Bautista, Dr. Teresita M. Espino, and Dr. Cesar Sevilla.

The HIPs are:

- Characterization, Improvement and Conservation of Goats
- Evaluation of Multiple Ovulation and Embryo Transfer (MOET) Technologies for Cattle
- Organic Production of Chickens
- Assessment of Dairy Systems Constraints and Opportunities for the Development of an RDE Framework
- Increasing Beef Productivity in the Uplands through Strategic Supplementation of Cows and Early Weaning of Calves
- Application of BIOTECH Produced Microbial Proteases for Food, Feed, and Other Industries
- Studies on the Applications of Cellulases for the Feed and Other Food Industries

HIPs are top priority projects that are of national significance to the country's productive system and national life. These projects address the immediate needs of the industry, hence they are integral requiring an interdisciplinary approach to meet established goals within a specified time frame - usually within two - three years. On its second year of existence (May 2000-April 2001), the network was granted P1.2 million to pursue its vision of a competitive and sustainable livestock and poultry industry. To boost its research capabilities, BAR allotted P2.9 million as Direct Research Cost (DRC). This would be used to fund priority projects for 2001. Fourteen new projects were approved by the network for possible funding by the Agrikulturang MaKAMASA Livestock and Poultry Program (AMLP)

The Livestock and Poultry RDE Network embodies the functional integration among institutions involved in the L&P RDE program in pursuit of the "one system-one program" approach under the AFMA. In its first year of operation in 1999, the network was initially given a budget of P1.6 million. In its maiden year of implementation of the National Livestock and Poultry RDE Agenda and Program, the network was able to finalize the Integrated National RDE Program (INRDEP). Since then, the L&P RDE Network has established a seven-point agenda and six program thrusts, formed the core technical team network members and farmer-fisherfolk advisory committees, and received and evaluated a total of 83 research proposals. Of the research proposals evaluated, seven priority projects were approved by BAR with assistance of the Senior Scientist Advisory Committee (SSAC) in CY 1999 and were given priority in terms of funding. These projects, coined as "high impact projects" or HIPs, are considered to be of national importance and outputs of which were expected to be usable within or after three years of implementation. *(Thea Kristina M. Pabuayon, Zandro Guevarra)*

Montemayor Bans UK Meat Imports

Department of Agriculture (DA) Secretary Leonardo Q. Montemayor recently issued a temporary ban on the importation of foot-and-mouth disease (FMD)-susceptible animals, their meat, meat products, and by-products from the United Kingdom. Memorandum Order no. 04 Series of 2001 was released after DA received a report from the Office International des Epizooties (OIE) or the World Organization for Animal Health confirming two recent outbreaks of FMD in UK.

Inclusive to this order is the immediate suspension of the processing, evaluation, and issuance of the Veterinary Quarantine Clearance or Import Permit for applications relevant to the importation of the said products from UK by the Bureau of Animal Industry (BAI). Likewise, all shipments of suspected or affected products originating from UK was ordered for stoppage and confiscation by all DA quarantine inspectors/officers at all major sea/airports. In addition to precautionary measures on FMD, Montemayor ordered the immediate re-export of the suspected mad cow disease-contaminated meat that has recently entered the country to dispel the fears and qualms of the general public of this disease entering and spreading into the market.

Prior to this, former DA Secretary Edgardo J. Angara has already issued Memorandum Order no. 19 Series of 2000, temporarily suspending the importation of animals, their meat and meat products, bovine embryo, meat and bone-meal and other feed ingredients derived from these animals from European countries such as United Kingdom, Ireland, Belgium, Denmark, France, Liechtenstein, Luxembourg, Netherlands, Portugal, Switzerland, Italy, Spain, and Germany.

Mad cow disease, technically known as the bovine spongiform encephalopathy (BSE), is a transmissible, neuro-degenerative, fatal brain disease of cattle. It has an incubation period of four-five years and is ultimately fatal to cattle within weeks to months from its onset. According to the World Health Organization (WHO), BSE is associated with a transmissible agent that affects the brain and spinal cord of cattle and lesions are characterized by sponge-like changes visible only through the microscope. It was stressed that this particular agent was highly stable and could resist freezing, drying, heating, and even pasteurization and sterilization. *(Rita T. dela Cruz)*

Renewed Role of Private Sector Valuable in Livestock R&D - Study Reveals

"With the establishment of cooperation between public and private sectors, much more could be achieved in research, by eliminating unnecessary duplication in research efforts, focusing more on the felt needs of the animal industry, and utilizing efficiently the country's resources."

Thus stated in the BAR-funded study on the Livestock Research and Development Agenda and Directions. This study is a component of the project on Imperatives for Trade Competitiveness and Technology Assessment of the Livestock Sector, implemented by the SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA).

Proposing a renewed role of the private sector in livestock R&D

Most livestock R&D are done by the state colleges and universities and other government agencies. Participation of the private sector in livestock R&D is limited to fund support. The study suggested a more active role by the industry by complementing the public sector's adequate manpower with their state-of-the-art facilities. This way, the quality of researches can be enhanced, providing better results for consumption by all sectors.

Many times, huge proportions of research funds get wasted when technologies generated by the public sector do not reach the commercial market. The private sector could serve as a facilitator in commercializing these potentially useful technologies.

Possible areas of research

Some private agencies hold vast collections of genetic resources while

See Private Sector, page 2

LDPs of the DA: An Analysis

The Livestock Dispersal Program (LDP) is one of the most expensive initiatives of the Department of Agriculture (DA). An assessment study on LDPs showed an even increasing budget allocation over the last 11 years.

The BAR-funded study, titled Assessment of the Livestock Dispersal Program of the DA, was the second component of the Imperatives for Trade Competitiveness and Technology Assessment of the Livestock Sector. The study focused on three LDPs of the most expensive commodity: cattle. It aimed to harmonize the results of the three LDPs taken into consideration, thus providing basis for assessing its impacts.

Profile of LDPs

Forty-five years ago, President Magsaysay's administration started implementing the LDPs. Until today, it has been one of the government's initiatives to provide

See LDPs, page 3

Botanicals Effective against Ectoparasites

Today, societal and scientific concerns regarding exclusive dependency on chemicals have emphasized the need for the development and introduction of cheap and environment-friendly pesticide alternatives. One such alternative is the use of botanicals to control ectoparasites in poultry, swine, and ruminants.

In a recent study conducted by animal scientists from the University of the Philippines at Los Baños (UPLB), eight botanicals were tested for their efficacy in controlling ectoparasites in poultry and selected ruminants namely: carabao, goat, sheep, cattle, and dog.

Top picture: Common carabao louse
Above: Kutchai leaves found effective against sarcoptic mange in dogs

The selected botanicals were: leaves of kakawate (Gliricidia sepium), akapulko (Cassia alata), neem (Azadirachta indica), calabash (Crescentia cujete), alagaw (Premna odorata), tobacco (Nicotiana tabacum), stems of makabuhay (Tinospora rumphii), leaves of kutchai (Allium tuberosum), and roots of tubli (Derris philippinensis). The plant parts were prepared either as a 100% crude powder and applied topically to the whole body of the animal or as a decoction or crude water extract in various concentrations. The decoction used oil or water as a carrier and it was applied on the test animals as a spray, dip, sponge bath, or as a "pour-on" application.

Results showed that crude powder of tobacco and tubli proved the most effective against chicken mites and lice. Tobacco decoction against chicken lice was highly effective at concentrations of 7.5% and 15% volume and applied using the dipping method. The selected botanicals in 40% coconut oil were fairly effective against chicken lice.

Trials on the sarcoptic mites of swine showed that calabash (40-60%), makabuhay (40%), kakawate (60%), and tubli (10-20%) were highly effective in controlling the mites. On the other hand, tubli (20%), makabuhay (20-40%), tobacco (20-40%) and neem (20-40%) mixed with oil proved fatal to the sarcoptic mites of pigs.

In vitro contact toxicity test on carabao-sucking lice using water and oil emulsion showed that 10-40% tubli,10-40% makabuhay, and 10-40% neem killed the lice after they were exposed to the botanical preparations for half an hour to five hours.

In vitro contact toxicity trial using the "pour-on" method of botanical plants in oil emulsion proved that tobacco and makabuhay were the most effective in controlling carabao lice.

For goat lice, kakawate, akapulko, calabash, alagaw, tubli, tobacco, makabuhay, and neem as a 20% decoction in oil emulsion, was found moderately effective. Also, a 20% decoction in oil emulsion of calabash, makabuhay, neem, tubli, alagaw, and akapulko were found effective in controlling sheep lice; while only makabuhay, neem, and tubli proved effective against cattle lice.

Finally, based on mite counts, lesion scores, and scratching frequency, it was found that tubli and kutchai decoctions had the highest potentials in eradicating sarcoptic mange in dogs.

Among the eight selected botanicals, tobacco, tubli, alagaw, makabuhay, and akapulko showed the most potential as natural ectoparasiticides for poultry and livestock. Though more research is needed to develop the potential of these promising botanicals, it is an imperative that researchers and other scientists use this information to develop a technology that could substitute or minimize the use of more expensive and high-risk pesticides on the farm and even in our homes. *(Junelyn S. de la Rosa)*

(This study was conducted by Dr. Carmencita C. Directo-Mateo from the Institute of Animal Science, College of Agriculture, UPLB and Dr. Mauro F. Manuel from the College of Veterinary Medicine, UPLB. For more information, please contact Dr. Mateo at 049-536-2551 or Dr. Manuel at 049-536-2727).

Private Sector...

having limited manpower. Prospects of partnerships could be explored in this field. The study identified five researchable areas where the private industry could play a major role:

- Animal breeding
- Food processing technologies and new products development
- Feed processing technologies
- Animal health products development and testing
- Technology commercialization

Private sector constraints

"Very little, if any, of the projects have examined cost effectiveness of a technology." This was the major sentiment gathered by the study from members of the private sector. Research activities, according to them, often fail to "consider seriously the economic aspects of a potentially-adaptable technology." Moreover, the study revealed the private sector's emphatic concern in reviewing policies affecting their industry. Policies on importation of feeds, veterinary medical products, additives, growth promotants, anti-molds, and meat products were among those mentioned. Members of the private sector likewise expressed concern on propriety rights on commercialized technologies. Engaging in public researches may "conflict with their motive of conducting their own research to be more competitive than other companies."

A tax restructuring scheme may also be needed to encourage the private sector in engaging in livestock R&D, the study disclosed. *(Laarni C. Anenias)*

Trichantera: Cheaper Feed Substitute to Soybean Oil Meal

(Photo by: The Ecological Farm Home Page (www.hcm.fpt.un/inet/-ecofarm/trees.com)

One problem among local hog raisers is the high cost of feed production. Costly commercial-mixed feeds such as the soybean oil meal (SBOM) contribute substantially to the high cost of feed ingredients, as they have to be imported in the country as part of the protein requirement in pig ration. The necessity, therefore, to find cheaper substitutes to lower the production cost of both feeds and finisher pigs to attain higher returns has been imperative.

Attempts have been made to look for an alternative source of protein to partially substitute SBOM in the diets of pigs, particularly the potentials of a fodder tree, which is abundantly growing in the country---the Trichantera gigantea. T. gigantea, also known as nacedero or madre de agua is a non-legume species that grows well with repeated cutting and without fertilizer input. This promising fodder tree, which was introduced into the country some years ago from Latin America (Columbia and Venezuela) adapts well in local tropical conditions. It can be planted to a wide range of soil types and elevations up to 1800 meters above sea level and can be planted at low densities of 20, 000 plants per hectare. It grows easily between plantation crops and produces 40-60 tons per hectare of fresh foliage. A potential source of protein, its leaves contain 18-22% crude protein in dry matter form.

The potential use of this fodder tree was observed and investigated through a preliminary study conducted by researchers from the National Swine and Poultry Research and Development Center (NSPRDC) of the Bureau of Animal Industry (BAI). After a preliminary feeding trial, whereby SBOM was replaced with T. gigantea leaf meal at 25%, 50% and 100% in starter, grower and finisher rations, respectively, the pigs showed a comparable average daily gain of 602 grams. Furthermore, it was noted that using T. gigantea in pig ratio, a farmer's income increased to about 50%.

Although it can be given to pigs in fresh form, researchers advised that T. gigantea be given to pigs as processed feed meal or mixed with commercial feeds to replace a portion of the total daily feed requirement. *(Rita T. dela Cruz)*

(This was based on the study entitled, 'Trichantera gigantea: A Potential Protein Substitute in Pig Ration.' For more information, please contact Mr. Frank A. Moog, Research Division Chief, Bureau of Animal Industry, Department of Agriculture, Diliman, Quezon City or call at telefax no. (02) 920-5053.)

ELISA Effective in FMD Diagnosis

The use of Enzyme-linked Immunosorbent Assay (ELISA) was found to be effective and extremely valuable for diagnosing, monitoring, and for the surveillance of foot- and-mouth disease in the Philippines. Specifically, the assay is useful in the fast detection and diagnosis of FMD suspect cases and in the measurement of antibodies against FMD virus (FMDV) in serum samples from all animals either vaccinated or infected.

This was revealed in a study conducted by scientists from FMD Laboratory, Philippine Animal Health Center (PAHC) of the Bureau of Animal Industry (BAI). According to Dr. Blesilda C. Verin, a veterinarian, and Rosalinda M. Arvesu, a medical technologist who led the team of researchers, ELISA should now be the standard test for diagnosis, monitoring, and surveillance of FMD in the country. It will also be used for potency testing of FMD imported vaccines.

It was only in 1975 that FMD diagnosis in the country was started. The test most commonly used then was the conventional Complement Fixation Test (CFT) and the Mouse Inoculation Test (MIT). However, both tests were found to be far less sensitive and specific as compared to ELISA (Cainglet et al. 1991).

For years, the World Reference Laboratory (WRL) for FMD carried out serological tests for the country. However, these were done on a minimal basis and proved to be costly for the government. In 1991, a comparative study between CFT and ELISA showed that the latter was more specific and sensitive in the diagnosis of FMD.

This event led to a collaborative project in 1995 between PAHC, BAI, and Food and Agriculture Organization/International Atomic Energy Agency (FAO/IAEA) on the use of ELISA technology for FMD diagnosis, and concluded that the assay should now be the standard test for both FMD diagnosis and serology. In the study, 522 epithelial samples and 4401 serum samples were tested starting 1995 to 1998. Using 522 samples, results showed that 17.9% were found negative and 84.78% were found positive for sero-types O and C. Within four years, 62 representative samples were sent to the World Reference Laboratory for FMD confirmation diagnosis. Out of 62 samples, 87% were diagnosed positive. Serum samples received were either for diagnosis, surveillance, post vaccination titre and for the FAO/IAEA external quality assurance program.

FMD virus is one of the vesicular diseases of pigs, cattle and other cloven-footed animals. While it was proven that FMD-infected meat has no harmful effects on humans if consumed, this can greatly affect the livestock industry, and has its economic impact reminiscent of the 1995 'FMD scare' which caused meat prices to dive in Luzon. *(Thea Kristina M. Pabuayon)*

(Adopted from the "Use of Enzyme-linked Immunosorbent Assay (ELISA) for the Diagnosis and monitoring of FMD in the Philippines" by Dr. B.C. Verin and R.M Arvesu. For more information, please contact. Dr. Verin and RM. Arvesu at tel. Nos. 928-2177 and 925-4343, respectively.)

LDPs...

additional income to farmers. The study looked into the practices of three flagship LDPs:

Multi-Livestock Development and Loan Program (MLDLP)

MLDLP started in 1989 from the initiatives of the National Agriculture and Fisheries Council. The program provides financial assistance to its beneficiaries through conduit banks that have satisfied the guidelines set by the program. Beneficiaries of the program must either be organized cooperatives or members of any farmers' associations or cooperatives. Livestock markets, local ranchers, and DA stock farms serve as sources of animals to be loaned to beneficiaries. The Bureau of Animal Industry (BAI) implements this program.

Barangay Livestock Breeding Loan Program (BLBLP)

BLBLP started in 1996 during the term of then DA Secretary Salvador Escudero III. The program aimed to "cater to the livestock needs of rural poor not included in the MLDLP," specifically to the 21 poorest provinces in the country. The program likewise covers Muslim regions and other coconut-growing provinces that are most often hit by typhoons. BAI likewise implements this program.

Dairy Cattle Dispersal (DCD)

DCD, implemented by the National Dairy Authority (NDA), aims at empowering dairy cooperatives; thus creating a more competitive dairy industry. NDA initially identifies new dairy sites in specific key areas. Cooperatives are then chosen, and given assistance in the form of dairy animal loans and technical assistance. When these cooperatives are equipped with the necessary skills to undertake dairy operations, institutionalization phase then follows when dairy cooperatives are left on their own.

Targets and accomplishments

The study indicated that "except for MLDLP, BLBLP and DCD had no clear target number of beneficiaries and animals to be dispersed annually since 1994." Data analyzed on program accomplishments were limited in years when BAI and NDA made targets for BLBLP and DCD, respectively.However, the BAI explained that in the case of BLBLP, these numbers were dependent on the number of requests received from regional, provincial, barangay officials, and other local government units.

Data gathered revealed that MLDLP had a 102% average accomplishment in number of beneficiaries in 1994-98. Accomplishment rates in animals dispersed during the same time period reached 151%. BLBLP, on the other hand, rated only 33% in both average animals dispersed and number of beneficiaries in 1997-98. Moreover, DCD likewise recorded a low average, 43%, in animals dispersed in 1996-97.

Recommendations

To complement the initiatives of the different LDPs, the study recommended that all LDP providers should come up with a set of unified implementation guidelines. Among the recommendations included for the enhancement of the guidelines were:

- Financing scheme that may allow the government a return of investment of about 10%-15%
- LDP Success/Failure Medium Term Milestones, hinged on economic and social well-being of beneficiaries
- LDP programs that enhances empowerment for rural poor and discourages dependency to government support
- Sustainable government livelihood or economic assistance to the poor

Another unified effort from the LDPs, this time in adopting an integrated set of socioeconomic indicators as basis for assessing all its initiatives, was likewise recommended by the study. A management information system could also be established to improve the LDP's monitoring and evaluation mechanism.

Moreover, the study recommended a review on the LDP objectives to integrate a mechanism for improving the genetic make-up of animals dispersed. A mapping activity, which would give a clear profile of the LDPs' beneficiaries and their specific locations, was likewise proposed. Capability-building training programs, designed to equip the LDP providers with the necessary skills, could also be implemented. *(Laarni C. Anenias)*

National Integrated RDE Agenda and Program for Livestock and Poultry

In the next 20 years, the demand for poultry products in developing countries will grow due to increased population, urbanization, and income growth. It is essential that certain reforms be made to insure that the food needs of our people are met. These could include linking small-scale producers with processors and marketers, and improving the state of backyard businesses that comprise most of our local industry. The Livestock and Poultry NIRDEAP embodies the integrated thrusts and directions for research, development, and extension and contain priority programs for a five-year period. It details the sequence of activities that address research or technological development to technology application. Under the NIRDEAP, present problems and future directions of the livestock industry are considered, responding to the needs of its clientele, especially small farmers. Envisioned to be at par with its international counterparts, our livestock and poultry industry is set to improve on productivity, production efficiency, and product quality through basic and applied research, as well as effective extension strategies. This goal will be achieved only through the different programs and strategies embodied in the NIRDEAP.

The most important issues that need to be addressed immediately are: lack of quality animals, loss of genetic diversity, inefficient utilization of feed resources, dependence on imported vaccines and biologics, inappropriate packaging and product presentation, unprofitable livestock production in mixed farming systems, improper waste management, inadequate policies for livestock development, and poor delivery systems/adoption of technology.

Agenda

A. Improving agriculture productivity and profitability through the improvement of the genetic potential of animals to local production systems through the development of strategic and sustainable health programs; and establishment of an efficient system of marketing and distribution

B. Protecting the environment through the development of cost-effective and environment-friendly production and post-production technologies

C. Saving biodiversity by conserving and efficiently utilizing native or indigenous animals

D. Improving Policy by providing appropriate and favourable policy environment studies for progressive livestock and poultry industries

E. Nurturing the knowledge system in agriculture by promoting efficient information, education and communication strategies

Programs

Genetic Improvement, Use, and Conservation of animals

Researchers now recognize the need to sustain a selection of highly-productive animals and at the same time hasten genetic improvement. These will assure farmers and breeders of an elite herd, a well-maintained gene pool, nucleus herd, multiplier farms and publication of breed standards. Some of the activities under this program include progeny testing of the performance of various crossbreeds, utilization of biotechnology, and the intensive selection and propagation of purebred animals.

Production and Management Systems and Animal Health Program for Economically-Important Pests and Diseases

The livestock sector must generate competitive technologies that can improve the viability of production at smallhold farms to be a world-class industry. This will be done through on-farm R&D on crop-livestock integration; indigenous feed resources conservation; efficient waste management; and proper animal health monitoring and vaccination.

Post-production Technology Development and Livestock Enterprise Development at the Villages

Drafted under this program is the development of new products with potential local and international markets. Some of the activities to be undertaken are development and promotion of high-value products and by-products; smallhold producers' empowerment; and the development of an efficient transport system for livestock and poultry products.

Policy Studies in the Livestock Sector

Focuses on the development of supportive policies and marketing strategies that will render the industry sustainable and competitive through a comprehensive review of existing policies.

Technology Promotion, Dissemination and Capability Building

With the use of the current advancements in communication and information technology, the livestock network will seek to upgrade its institutions and manpower capabilities, and promote technology transfer and utilization. This will be done through the adoption of information and communication strategies, strengthening of DA-local government units-state colleges and universities extension linkages in the delivery of technology-based enterprises and by establishing a sustained integrated support system. *(Thea Kristina M. Pabuayon)*

Twinning...

overcome the problem of "Freemartinism", an inhibition of the development of the female co-twin's reproductive organs caused by some chemical substances secreted by the developing male co-twin embryo through the blood vessels of the placenta. This phenomenon occurs usually in twins that developed in the same uterine horn. Further, to determine if this technology can solve the problem of "Freemartinism", scientists placed the embryos in separate uterine horns. Although initial examination one week after birth showed a normal vagina of the female calf, the cervix, uterus and ovaries were found under-developed after the animal was slaughtered at 18 months of age.

Aside from AI and embryo transfer, there are two other methods to induce twinning in cattle. These are: (1) transfer of two embryos into the uterine horn/horns of the surrogate cow; and (2) ovulation of two ova by administration of low dosage of follicle-stimulating hormone or pregnant mare serum gonadotrophin. *(Mary Charlotte O. Fresco)*

(For more information, please contact: Dr. Antonio A. Rayos, Dr. Demetrio Marcial, Mr. Juan Malabanan, DTRI, UPLB, College, Laguna at tel. no. (049) 536-2513)

Mad Cow...

A. Here are the measures that are recommended by WHO to reduce exposure to the BSE agent:

a) All countries must prohibit the use of ruminant tissues in ruminant feed and must exclude tissues that are likely to contain the BSE agent from any animal or human food chain.

b) This means that brain tissue, spinal cord, intestines should not be eaten. That is, they should not be used in preparing "nilagang baka", "sisig" and "goto".

c) All countries are encouraged to conduct risk assessments to determine if they are at risk for BSE in sheep and goats. It is advised that any tissue which may come from deer or elk with chronic wasting disease (CWD, a transmissible spongiform disease of North American mule deer and elk) is not used in animal or human food. However, there is no evidence to suggest that CWD in deer and elk can be transmitted to humans.

d) No infectivity has yet been detected in skeletal muscle tissue. For one's own peace of mind, nervous and lymphatic tissues from animals suspected of having BSE, should be removed. *(Junelyn S. de la Rosa)*

(Sources: www.whyfiles.com; www.cnn.com)

Mad Cow Disease: Know the Risks

Years after it was supposedly vanquished, the brain-eating disease that kills cows and some people who eat them is on a comeback. Today, the mad cow disease or the Bovine Spongiform Encephalopathy (BSE) is again breaking headlines and is stirring a lot of havoc and public fear all around the globe. Here are some of the most frequently asked questions and answers regarding BSE.

Q. What exactly is BSE?

A. BSE or mad cow disease is one of several fatal brain diseases called transmissible spongiform encephalopathies (TSEs). BSE is a progressive, lethal central nervous system disease of cattle. The brain looks like a sponge, hence the term spongiform because the brain contains vacuoles. In 1982, Stanley Prusiner, a biochemist at the University of California suggested a radical idea—that various encephalopathies were caused by a rouge protein—a "prion".

Q. What are prions?

A. Prions or PrP proteins are abnormal rouge proteins able to convert normal proteins into more abnormal forms. They contain no nucleic acids (DNA or RNA). They consist of a single molecule containing about 250 amino acids, termed the PrP protein.

Abnormal PrP proteins are folded in a way that allows them to resist normal protease degradation. Over time, this results to a build-up of aggregates of PrP, especially in neurons in the brain.

Q. Is there a risk that BSE will infect people?

A. Yes. The TSEs were once considered unlikely to infect other species. However, in 1996, the UK government acknowledged that eating contaminated meat was the "most likely explanation" why 10 young people had the variant Creutzfeldt-Jakob disease (vCJD). The awkward name reflects the similarity to Creutzfeldt-Jakob disease (CJD), a deadly brain illness that strikes about one person per million per year, due to genetic or unknown causes.

While CJD mainly affects the elderly, vCJD appears among younger people. The quick and gruesome death starts with mood swings, numbness, and uncontrolled body movements. Eventually, the mind is destroyed, somewhat like Alzheimer's, another brain-wrecking disease. Many vCJD victims die four months after symptoms appear. There is no treatment.

Q. What about TSEs in other animals?

A. Scrapie is the TSE disease in sheep and goats. Mink and North American mule deer and elk can contract TSEs. A neurological disease in household cats and in ruminant and feline species in zoos has been linked to BSE. Most cases in such animals appear to have occurred in the UK.

Q. What is the infectivity of BSE-containing material?

A. Infection is dose-dependent but the required dose for BSE transmission to cattle is small. If consumed, 500 mg to 1 g infected brain appears sufficient to infect. The BSE agent has been found only in brain tissue, spinal cord and retina of cattle naturally affected with BSE. It has not been found in meat or milk. Similarly, it is not transmissible through meat or milk. Traces of the BSE agent are detectable in the small intestines of calves that had been fed large doses of meal from BSE-infected animals.

Q. What about the safety of human and veterinary vaccines made from bovine products?

A. The World Health Organization (WHO) reported that human and veterinary vaccines from bovine materials carry the risk of transmission of animal TSE agents. It was recommended that the pharmaceutical industry avoid the use of bovine materials and materials from other animal species in which TSEs occur. These include nine vaccines regularly given to millions of American children, including common vaccines to prevent polio, diptheria, and tetanus. These precautions apply to the manufacture of cosmetics as well.

Q. Can vCJD be transmitted through blood transfusions?

A. In 1997, new animal studies suggested that vCJD could be transmitted through the blood. White blood cells, which form part of the immune system and are found in the lymph glands, were isolated as one of the high-risk tissues for BSE infection. As a result of this concern, the British government required the removal of white blood cells from donated blood.

The fact that vCJD could enter the lymph system raised further possibility that it might infect the tonsils or appendix, both of which contain large amounts of lymphoid tissue.

Q. How long is the incubation period of vCJD?

A. The incubation period is yet unknown. Some experts believe that it could be as long as 30-40 years. In August last year, a new research indicated the existence of a hidden "subclinical" form of BSE, which produced no symptoms but could nonetheless be infectious. This raised the frightening possibility that not only cattle but sheep, pigs and poultry exposed to BSE via animal feed may secretly harbor the disease.

Q. When did the BSE outbreak start?

A. The illness was first identified in 1985 by a vet who was puzzled by the odd symptoms exhibited by sick cows in a dairy farm in Southern England. Scientists found evidence linking the new illness to the sheep disease—scrapie. It was technically named Bovine Spongiform Encephalopathy (BSE) but it became popularly known as mad cow disease—because of the way infected cattle behaved.

Scientists believed that BSE was created when cows were fed scrapie-infected feeds manufactured from abattoir offcuts. Experts theorized that new manufacturing techniques in feed production in the 1970s and 1980s allowed a resilient strain of scrapie to enter the feed and for it to re-emerge in a new form in cattle disease---BSE.

Q. How widespread is the BSE outbreak?

A. The WHO says that approximately 180,000 cases of BSE have been reported in Britain and relatively small numbers of BSE cases (in total approximately 1300) have also been reported in native cattle in Belgium, Denmark, France, the Republic of Ireland, Liechtenstein, Luxembourg, the Netherlands, Portugal, and Switzerland.

Germany and Spain reported their first native cases in November 2000. A couple of dozen cases have also been reported in Canada, the Falkland Islands (Islas Malvinas), Italy and Oman.

Q. What are the measures that can reduce exposure to the BSE agent?

See Mad Cow, page 3

The Livestock and Poultry Industry: An Overview

World

With the globalization phenomenon now almost a cliché, the Asian crisis will have far more reaching repercussions on the demand and supply for livestock and products in the world market. If a severe crisis scenario unfolds, world meat demand will be 8%t below the baseline trend (2% below in the moderate scenario) and developing countries in Asia will be hit the hardest. Philippine meat demand will decrease by almost one-third. The biggest drop in livestock demand in developing countries will be for pig meat (19%), followed by poultry and beef, 13 and 8%, respectively.

Although the contraction in the demand for meat in Asia could be large, its increasingly important role in the global food market will not be threatened. Global meat demand will still be dominated by developing countries. That is, even in the severe scenario---the developing countries will still account for 56% of the global meat demand. By 2020, it is projected that the developing countries will produce 60% of the world meat and 52% of the world milk.

Local

USDA reported that livestock production in the Philippines increased in 1999 due to the return of more normal weather conditions and renewed meat demand resulting from a slight improvement of the national economy. Cattle (inclusive of water buffalos), swine and other segments of the livestock subsector showed positive growth (BAS Reports 2000).

Changes in importation policies and procedures will benefit local livestock production. However, cattle production is expected to grow slower than its swine counterpart because of the reduced cattle inventory and the inherent production inefficiencies of the industry. For swine, local production is likely to continue its strong and steady growth in 2000 and beyond. Substantial private sector investments will make it relatively efficient.

Consumption of beef and pork are still expected to increase from their previous levels as a result of the rapidly increasing Philippine population. Increased human consumption and processing demand will raise cattle slaughter, decreasing the cattle population in the next two years. For pork, the favourite meat of the average Filipino, demand is likewise expected to accelerate until 2001 and the swine population will continue to expand.

Consonantly, local poultry production grew modestly (4%) in 1999 and was expected to grow last year but at a much slower rate (USDA Reports 2000). Chicken population increase in 2000 reached 118 million birds compared to the previous year's 116 million birds (BAS Reports 2000). Native/improved chicken types dominated the local chicken population at 71 million birds (60%) followed by broilers--- 30 million birds (26%) and layers at 16 million birds (14%). However, poultry production is likely to slow down this year as local production is expected to face more competition from poultry meat imports. *(Junelyn S. de la Rosa)*

(Sources: BAS 2000; USDA GAIN Report# RP0045)

Scientists Find Twinning Technology in Dairy Cattle Successful

The cow (*Bos taurus* for European breeds and *Bos indicus* for Indian Breeds), belonging to the family Bovidae, is characterized as a uniparous large ruminant - an animal capable of producing only a single offspring per birth.

The low prolificacy of cattle coupled with the small population used in breeding have contributed to the dwindling cattle production in the country. This problem may just have found solution in the first successful induced twinning in dairy cattle spearheaded by Dr. Antonio A. Rayos, veterinarian and assistant professor at the Dairy Training and Research Institute (DTRI), UP Los Banos.

In a series of laboratory tests, two healthy calves (male and female), each weighing 18 kg were successfully conceived after 254 days of gestation, with the female co-twin having a normal reproductive tract on examination.

Scientists used two pure Holstein Friesians as donor and recipient cows in this study. Both cows were injected with dinoprost tromethamine to synchronize estrus period. Three days after the injection, both cows were in estrus and were artificially inseminated with frozen-thawed semen from two superior bulls, with the Holstein-Sahiwal bull for the donor and the Holstein Friesians for the recipient cow. Having reached its initial stage of development after one week, the embryo was flushed out of the donor cow and was transferred non-surgically using an embryo transfer gun to the uterine horn of the recipient cow previously bred by artificial insemination (AI). Forty-five days after the embryo transfer, the left and right uterine horns of the recipient cow were confirmed pregnant.

Fifty days after birth, the male calf weighed 45 kg while the female calf weighed 54 kg, indicating normal growth.

Induced twinning in dairy cattle was adopted from the Japanese practice of multiplying the wagyu or Japanese black cattle, the source of very expensive and famous KOBE and Matsusaka beef. Dairy cows were used in this study to prove whether induced twinning can

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