

پیشہ ڈاکٹر خالد محمود شوق نے مسلمانوں اور عورتوں کے لیے فیصلہ آ باد سے چھوڑ کر دفعتاً ہفت روزہ روز غزنی بنیوا ایلز و ہوز 392/A کمن آ باد فیصلہ آ باد سے شائع کیا۔ المظاہرہ اکثر تین تحسین، اگر کوئی کلام مذہبی و دنیوی خالیہ

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GROWTH PROMOTERS FOR FARM ANIMALS

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The different categories of feed additives for farm animals are referred to as Natural Growth Promoters or Non-antibiotic Growth Promoters (AGPs) in livestock production. I hope

They are commonly regarded as favourable alternatives to Antibiotic Growth Promoters (AGPs) in livestock production. Natural Growth Promoters (NGPs) include predominantly organic acids, probiotics, prebiotics, symbiotics, phytochemicals, tannins, feed enzymes and immune stimulants. An ongoing research for alternatives has created a large variety of NGPs for poultry, ruminants, aquatic species and others.

The main advantage of NGPs over AGPs is that they do not usually bear any risk regarding bacterial resistance or undesired residues in animal products such as meat, milk, or eggs. Addition of NGPs to feed farm animals may have a number of beneficial effects including:

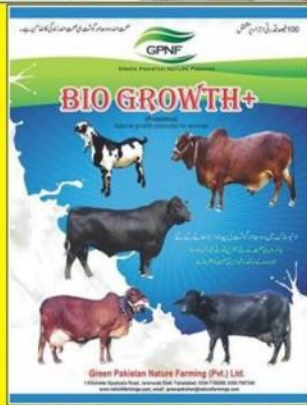
- rapid development of a healthy gut flora
- stabilisation of digestion
- increased growth performance
- stimulation and rapid maturation of the immune system
- reduced incidence of diarrhoea
- improved feed efficiency
- lower mortality rates
- higher profitability

ACIDIFIERS

Acidifiers such as organic acids or their salts are used to prevent microbial degradation of raw materials or finished feeds, especially under poor storage conditions (e.g. high moisture content, high levels of contamination with moulds). Moreover, acidifiers may improve growth performance through establishment of low gastrointestinal pH conditions which support endogenous digestive enzymes and reduce undesired gut microorganisms. Many dietary acidifiers are based on propionic acids, formic acid, lactic acid and others, either as single components or in combination. Some acidifiers also contain organic acids (e.g. phosphoric acid).

PROBIOTICS

Probiotics are live microorganisms or viable spores which support the development of a beneficial gut microflora. Probiotic bacteria (e.g. from the genera *Lactobacillus*, *Bifidobacterium*, *Enterococcus*) counteract undesired microorganisms such as salmonella, or *E.*



coli by blocking receptors on the gut wall, production of antimicrobial substances or activation of the immune system.

PREBIOTICS

Prebiotics are carbohydrates which are indigestible for the host animal. On the other hand they are selectively fermented by beneficial gut bacteria, and therefore, support a healthy gut microflora. These include fructo oligosaccharides (FOS) including Inulin, transgalactose oligosaccharides (GOS), xylitol oligosaccharides (XOS) and Soy oligosaccharides such as starchy ore, verberose and raffinose. Mannan oligosaccharides are sometimes included as prebiotics but are not fermentable and so might be more appropriately termed immunosaccharides since they act as decoys for pathogen attachment (salmonella and *E. coli*) and result in increased immunoglobulins (IgAs) at intestinal level.

SYMBIOTICS

Combined administration of probiotics and prebiotics, referred to as Symbiotics, is supposed to cause synergistic effects in terms of gut health and performance. **PHYTOGENICS** Phytochemicals are derived from herbs, spices or aromatic plants and have shown antimicrobial, antifungal, antiviral, antioxidant or sedative properties. They are known for their appetising effects, since they increase the palatability of the feed and stimulate endogenous digestive enzymes. Moreover, phytochemicals have a pronounced impact on the gut microflora. **TANNINS** Tannins are polyphenolic compounds produced by plants, ranging in concentration from less than 2% to more than 20% of dry weight and may protect plants from herbivore, increase resistance against pathogens, or protect tissues such as wood against decay. In vitro and in vivo results suggest that two of the most abundant and common sources of tannins, chestnut (*Castanea sativa*, hydrolyzable tannins) and quebracho (*Quercus laevis*, condensed tannins) extracts, are effective to reduce and control infection. Moreover, they are considered a natural alternative to antibiotics to develop resistance against the diverse range of molecules that contain these plant compounds.

FEED ENZYMES

Animal feeds contain varying levels of indigestible nutrients and undesired components such as fiber, phytate or proteins with antigenic effects. Different feed enzymes such as carbohydrases, phytases, or protease, can be included in feeds to improve the utilisation of energy and nutrients or to degrade several undesired components. Moreover, some enzymes (e.g. any-lases, lipases) can be added to the feed of young animals in order to support the endogenous enzyme secretions.

IMMUNE STIMULANTS

Different feed additives may function as stimulator or modulator of immune processes. Specific cell wall fragments from bacteria or yeasts or sea algae may induce activation of immune cells (e.g. macrophages, lymphocytes).

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FOOD FOR THOUGHT!

HUZAIMA BUKHARI AND DR IKRAMUL HAQ

FAILURE AT THE JUSTICE FRONT

Since taking the oath on December 31, 2016 as 25th Chief Justice of Pakistan (CJP), Mian Saqib Nisar, repeatedly stressed the need for speedy justice, but near to nothing has been achieved. In January 18, 2019, things have deteriorated, instead of improving. According to the data available on the website of the Law and Justice Commission of Pakistan (L&JCP), there was a huge pendency of 1,81,07,45 cases in various courts as on September 30, 2018 by the end of 2019, 300,000 plus cases would be added. In the Supreme Court itself, total pendency was 40,243 cases (2,367 cases per judge). It has proved that mere good intentions could not bring efficacious dispensation of justice; it requires concentrated efforts and comprehensive structural reforms. The data by L&JCP confirms that every month more cases are filed than disposed through the justice delivery system. Despite this critical situation, no emergent plan has been adopted to deal with it. No effort whatsoever has been made till today to remove the cause of unnecessary litigation and reduce the backlog. Our courts are still following the outdated procedures and have not yet adopted any modern system as many countries have adopted e-system for the filing of cases and their quick disposal through fast-tracks follow up using the offices of magistrates at grass root levels. Neither the judiciary nor the government has so far reviewed/updated laws/regulations for effective/speedy justice system, nor has judiciary prepared/presented any concrete plans to discard the outdated procedures suggesting the need for judicial reform.

It is a fact that nothing worthwhile has been done by Judiciary and Legislature to bring fundamental changes in the existing exploitative, antiquated and inefficient justice system. There is a real malady. The reform agenda for Judiciary, Executive or Legislature based on patchwork here and there can never succeed, unless fundamental structural changes are made. There is an urgent need for replacing the prevalent, decayed and disintegrating structures with modern and efficient models working successfully in other countries with active people's participation. Since independence, we have failed to reconstruct/modernize/deconstruct our obsolete state institutions, and judiciary is no exception. Mere cliché and rhetoric about reforms, as we have been hearing for a long time, will not serve any purpose. Mentioning about death of competent judges, delays in dispensation of justice, huge pendency etc. alone is not enough; these are just symptoms of a very sick system but where is the correct prescription for cure? Curing the root cause of illness will be just an exercise in futility. Devising a speedy justice system is a daunting challenge in Pakistan due to large pendency. The existing inefficient and outdated judicial system is exploited by money power and the hordes of extraordinary salaries and perks cannot improve the system. One needs skilled manpower, efficient network, automated procedures and strong system of checks and balances weed-out those who fail to deliver.

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An efficient justice system can only be established if efforts are made to produce highly competent adjudicators at the lower level, who are recruited transparently and trained extensively. It will help produce competent judges for higher courts in the future. All appointments of members in all the special tribunals must be placed before the Chief Justice of the province in which the members perform their duties. The Chief Justice himself or any committee approved by him may look into such appointments to approve or disapprove the same, which should be binding for the Federal Government. All existing and future appointments in all tribunals must be screened by the judicial organ of the State.

The main aim of judicial reforms should be elimination of unnecessary litigation and facilitating smooth running of affairs between the State and its citizens. Once we learn to act within the four corners of law, there would be a drastic decrease in litigation. It is painful that presently the governments are the main litigants. They usurp the rights of people and then sue the poor citizens in courts. We all know the reasons for this moribund state of affairs but nobody wants to fix it. Judicial reforms do not stipulate asking for more judges and funds but eliminating unnecessary litigation and quick disposal and to help reduce its occurrence in the first instance.

It is pertinent to mention that the Eleventh Finance Commission of India recommended a five-year scheme for creation of 1734 Fast Track Courts (FTCs) for disposal of long pending cases and provided IRS 502.90 crores as "special provision and upgradation grant" for judicial administration in the terms of

equivalent work being undertaken on VBD of livestock.

Local government and local staff need to be involved in putting in place strategies to manage and control VBDs. Communities need to be shown examples of success stories, and assisted in undertaking cost-effective control of VBD management and control versus inaction.

Improving levels of relevant expertise is particularly important for farmers in poorer countries, so that they can implement appropriate control measures for VBDs. For example, there should be more donor-funded information campaigns for farmers so they know when it is appropriate to use insecticides, which ones to use and how to use them.

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DR AQEEL JAVEED
(ASSOCIATE PROFESSOR TENURED/
CHAIRMAN, DEPARTMENT OF PHARMACOLOGY
& TOXICOLOGY) HAS BEEN ELECTED AS
MEMBER OF THE PAKISTAN ACADEMY OF
SCIENCES IN THE YEAR 2018

Dr Aqeel Javeed (Associate Professor Tenured/ Chairman, Department of Pharmacology & Toxicology) has been elected as Member of the Pakistan Academy of Sciences in the year 2018. He is the First Veterinarian who has been elected as Member of the Pakistan Academy of Sciences. The Pakistan Academy of Sciences is regarded by the public and the government as a repository of the highest scientific talent available in the country, and is generally supported and consulted in all matters relating to scientific education, research and development.



PROF. DR. KHALID JAVED RETIRED FROM UNIVERSITY OF VETERINARY AND ANIMAL SCIENCES LAHORE ON 01-01-2019

Prof. Dr. Khalid Javed graduated from University of Agriculture, Faisalabad in the area of Animal Husbandry in 1982. After graduation he joined Livestock and Dairy Development Department, Government of Punjab as Veterinary Officer and remained engaged in research and extension activities in various capacities at different livestock research stations and breed improvement centres. He earned his Master's and Doctorate degrees in Animal Breeding & Genetics also from University of Agriculture Faisalabad. He joined University of Veterinary and Animal Sciences Lahore in 2003. Dr. Khalid Javed's area of interest and expertise is Animal Breeding, Population/Quantitative Genetics and Statistical methods in animal Production Research. He analyzed production data of various livestock species to characterize phenotypic and genetic structure related to different traits of economic importance and subsequent



selection. His research focus is on selection and breeding of large and small ruminants. Dr. Khalid Javed supervised 7 Ph.D and 20 M.Phil students in the area of Animal Breeding and Genetics. Besides this he also served as member supervisory committees of 20 Ph.D and 35 M.Phil students in different disciplines related to animal production and health. He published 140 scientific articles to disseminate knowledge and techniques to the researchers and livestock producers about various areas of animal husbandry for improving behaviour, health,

growth, fertility and production of livestock. He attended many international conferences abroad to present his research work in the area of Animal Breeding and Genetics. Along with teaching and research he worked as Chairman department of Livestock Production and member of various statutory bodies of the University like Finance & Planning Committee, ASRB, Academic Council, Convener Students Disciplinary and Advisory Committee, Convener House Allotment Committee etc. He also worked as Convener and

member of various committees constituted by Govt. of Punjab regarding Animal Breeding and Genetics and was also appointed as Technical Member in Livestock Breeding Tribunal. He is Senior Editor of an internationally recognized (ISI Thomson Impact Factor 0.407, JCR 2017) Journal of Animal and Plant Sciences (The JAPS). He is also on the Editorial Board of different international journals. He authored a book on Animal Breeding and Genetics for LAD students and edited another one on Livestock Production. He actively contributed for establishment of UVAS Ravi Campus Pattoki as Resident Officer and as Project Director Small Ruminant Research Centre. After 35 years dedicated service, Dr. Khalid Javed retired on 01.01.2019. Services rendered by Dr. Khalid Javed to the Livestock sector and to the University are exemplary and deserve appreciation at every level.

ORGANIC POULTRY PRODUCTION IN THE US

Sustainable agriculture is a hot topic across the globe, with pressure mounting on farmers to ensure that everything from manure storage to using technology is as efficient as possible. Poultry World visits a pioneering US producer to find out how the farm operates.

Chicken is becoming one of the most widely consumed meats in the United States, with per capita consumption estimated at 41.6kg in 2018. 4kg more than 10 years ago. With consumption predicted to keep rising, alongside growing interest from consumers about how their food is produced, there is a bigger drive than ever before for poultry producers to be as efficient and sustainable as possible. George Cartanza is an organic poultry farmer near Dover on the East Coast of the US. Despite having no background in farming, Ms Cartanza has had a long-standing career in the industry. After graduating she worked as a flock supervisor for Perdue one of the biggest consumer brands in the US and later went on to work for Mounaire Farms before building her first chicken house in 2006.

to 7 weeks in four 65ft x 600ft chicken houses, each containing 37,000 birds. The farm rears five-and-a-half flocks a year on a vertically integrated contract for Coleman Foods, who are responsible for the sourcing of the chicks and the feed. Annual production levels equate to 2.3m kg of meat enough to feed 59,800 people a year. "I think it is really interesting that as farmers we can be so efficient with our production to accomplish that."

Implementing sustainable measures
Environmental stewardship plays a big part in Ms Cartanza's sustainability goal and through grant funding from the US Department of Agriculture's Natural Resources Conservation Service (NRCS) she has been able to implement a number of measures including heavy use concrete pads outside

the farm switched to organic production to improve margins. The fans suck the air out of the house via a 6 inch cooling pad which filters moisture this process is known as evaporative cooling. As the air is sucked through the pad it drops the air temperature by 10-12°C and pulls a wall of cool air through the house which creates wind chill. "That means if it is 30°C outside, it will feel cooler in the house than it really is."



Good ventilation in the poultry house

can improve gut flora and immunity. Ms Cartanza has also installed a specially designed ventilation system to draw hot air out of the buildings rather than just cooling hot air. "This is probably the number one thing that has reduced stress heat stress in particular for birds in the summer months," she explains. Her passion and drive for

the University of Delaware. This links the research carried out at university level with farmers. "I do outreach and education with farmers to try to help them be better neighbours and better stewards. I teach them about good ventilation within a poultry house, anything to do with poultry production."

Her passion and drive for



The farm invested in a new ventilation system that offers complete air exchange every 60 seconds.

Organic production
In 2015, after noticing a change in market dynamics, Ms Cartanza decided to switch to organic production. "The main driver behind that was the real push in the US to go antibiotic free," she says. "My thoughts were that if we were going to take on the additional risk of not using any antibiotics then why not try to move myself up in the value chain."

Organic production costs 3 times more than a conventional system largely due to feed prices particularly soy which has rocketed in price this year as a result of aggravated trade relations. So from both a consumer and financial perspective it is critical to be as sustainable and efficient as possible, she adds. Chicks arrive on-farm at one day old and are grown

the chicken houses and manure storage buildings to reduce water pollution. She also has a vegetative buffer around the entire farm, has installed energy-saving LED light bulbs throughout the chicken houses and has a unique composting system for litter and dead-stock. **Re-spreading litter in the shed**
"Litter is extremely expensive, so we grow chickens on built up litter, conditioning it in between flocks," she explains. "We have 2 pieces of equipment to do this: One that we use to pulverise anything that tests over 30% moisture and then we aerate it to dry it out. The other heats the litter to kill off any harmful pathogens meaning we can then re-spread the litter in the shed."

As well as her poultry unit at home, Ms Cartanza also has a full-time job working as a poultry extension agent

ARID VARSITY BEING RUN BY DEPUTY REGISTRAR AFTER RETIREMENT OF PRO-VC

Rawalpindi: The Pir Mehr Ali Shah-Arid Agriculture University Rawalpindi (PMAS-AAUR) has been operating without a vice-chancellor for two years. Now, after the retirement of the pro-vice chancellor on Jan 3, the university is being run by a deputy registrar.

More than 46pc of the posts of heads of department have also been vacant for a few years as have been main posts such as that of the university's treasurer, controller examination and registrar. "The future of the university's 1,100 students is at risk due to the shortage of faculty and the absence of a head," a senior faculty member said.

He said that after the retirement of Dr Rai Niaz as vice-chancellor on Jan 24, 2017, the acting charge was given to pro-vice chancellor Dr Sarwat Naz Mirza who also retired on Jan 3 this year. "Dr Mirza was the registrar of the university and was promoted as pro-vice chancellor. The post of registrar then fell vacant and the deputy registrar, Aqeel Sultan, who is a BPS-18 officer, was given additional charge as registrar," he said. The faculty member added that with the posts of vice-chancellor and pro-vice chancellor empty, the varsity is being run by a BPS-18 deputy registrar. "Due to the absence of a vice-chancellor, a selection board was not constituted for the last two years for the recruitment of teaching faculty as the pro-vice chancellor does not have the authority to form such a board," he explained.

He said the university had to hire lecturers and teaching staff on contract basis to run the day to day affairs so that students' academic year is not affected. There is no director for Advance Studies, University Institution of Information Technology or deans for management sciences and agriculture engineering. "In Sept 2018, HEC banned 14 MPhil and PhD degree programmes in the university and asked that admissions in these programmes be withdrawn as the university had not followed the

rules for running them," the faculty member said. He added that HEC had made it clear that it would not allow the university to start the degree programmes till it overcame the shortage of staff and other facilities including buildings. On the other hand, an official of the Punjab Higher Education Department told Dawn that no proposals for a vice-chancellor for the university had been received yet. However, he said Punjab Governor Chaudhry Sarwar, who is the varsity's chancellor, will appoint a vice-chancellor as soon as possible.

PMAS spokesman Dr Nadeem Malik told that many posts are vacant in the university and that the provincial government has been informed of this. He said HEC's Quality Assurance Agency Committee will visit the university to check its facilities so that the degree programmes can be restored. The registrar will look after the day to day affairs of the university in the absence of a head, he said, and that the registrar will not make decisions about the formation of a selection board and other policy matters.

BOILED EGGS DIET



	Breakfast	Lunch	Dinner
Monday	2 boiled eggs and 1 fruit	2 apples 2 pieces of sweet potato	1 large plate of salad and chicken
Tuesday	2 boiled eggs and 1 fruit	Green vegetables and chicken salad	vegetable salad, 1 orange, and 2 boiled eggs
Wednesday	2 boiled eggs and 1 fruit	low-fat cheese, 1 tomato, and 1 piece of sweet potato	salad and chicken
Thursday	2 boiled eggs and 1 fruit	Fruit	salad and steamed chicken
Friday	2 boiled eggs and 1 fruit	vegetables and 2 Boiled eggs	Salad and grilled fish
Saturday	2 boiled eggs and 1 fruit	Fruit	Chicken and steamed vegetables
Sunday	2 boiled eggs and 1 fruit	Tomato salad, steamed vegetables, and chicken	Steamed vegetables

WATTAgNet TOP COMPANIES			
ASIA-POULTRY PRODUCERS			
Head slaughtered (broilers, millions)	Company name	Country	More information
1,300.0	New Hope Lihe	China	http://bit.ly/2xTcH2H
807.0	Wen's Food Group	China	http://bit.ly/2QVb0P8
685.0	CP Group (including CP Foods, COFCO, Chio Iri and Sanyang)	Thailand	http://bit.ly/2LwA8
400.0	Sargento Foods	India	http://bit.ly/2Mfmx0c
380.0	Deyang Group	China	http://bit.ly/2xWQdGh
350.0	Sunrise Development Co. Ltd.	China	http://bit.ly/2xW3Ch1
320.0	Japfa Ltd.	Singapore	http://bit.ly/2xTqgKd
320.0	San Miguel Pure Foods	Philippines	http://bit.ly/2xM2Vh1
270.0	Huimin Group	South Korea	http://bit.ly/2xT9vRg
250.0	Oli China (subsidiary of OSI Group)	China	http://bit.ly/2Mfmx0c
241.0	DuChen Food (Asia) Ltd.	China	http://bit.ly/2xM2Vh1
234.0	Jungsu Lihe Animal Husbandry	China	http://bit.ly/2Mfmx0c
200.0	Fengxiang Group	China	http://bit.ly/2xW3Ch1
200.0	Huanying Agricultural Development Co. Ltd.	China	http://bit.ly/2xTqgKd
192.0	WH Group	China	http://bit.ly/2xW3Ch1
180.0	Cargill Meats Asia	Thailand	http://bit.ly/2xTqgKd
160.0	Yisheng Livestock & Poultry Breeding Co.	China	http://bit.ly/2xW3Ch1
148.0	Thai Foods Group	Thailand	http://bit.ly/2xM2Vh1
144.0	Bounty Fresh Group	Philippines	http://bit.ly/2xW3Ch1
130.0	Batanga Group	Thailand	http://bit.ly/2xW3Ch1
130.0	Qingdao Nine-Alliance Group	China	http://bit.ly/2xM2Vh1
125.0	Enay Bio	South Korea	http://bit.ly/2xW3Ch1
120.0	Shanxi Suihai Group Ltd.	China	http://bit.ly/2xW3Ch1
100.0	CJ Cheil Jedang	South Korea	http://bit.ly/2xW3Ch1
100.0	Lamshing Corp. Group	Thailand	http://bit.ly/2xM2Vh1
100.0	Yongfeng Food Industry	China	http://bit.ly/2xW3Ch1



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2-DAYS INTERNATIONAL WORKSHOP ON 'ANIMAL HANDLING AND MODELING' BEGINS AT UVAS

Lahore: The Department of Physiology of the University of Veterinary and Animal Sciences (UVAS) Lahore in collaboration with Higher Education Commission (HEC), Haryana University Pakistan and University of Cambridge UK organised a two-day international workshop on 'Animal Handling and Modeling' here in City Campus on Wednesday.

Pro Vice-Chancellor Prof. Dr. Masood Rabbani presided over the inauguration session of the workshop while Dean Faculty of Bio Sciences Prof. Dr. Habib-ur-Rehman, Operational Director Department of Clinical Neurosciences from University of Cambridge UK Dr. Sohail Ejaz, Dr. Imtiaz Rabbani and postgraduate students, professionals related to veterinary & animal sciences and medical sciences and experts from different countries, including the United Kingdom (UK), the Philippines, South Korea and also from different institutions all over Pakistan were present.



Speaking on the occasion, Prof. Dr. Masood Rabbani said that for the prevention of diseases and research in animals it is directly needed to follow the international standards and protocols regarding how to handle laboratory animals, their humane handling and collection of blood samples under the umbrella of one health. He said that for researchers animals' health is on priority while conducting different experiments. He said such workshops are beneficial for professional learning of the latest methods of research and innovative knowledge. Prof. Dr. Habib-ur-Rehman presented the vote of thanks.

Speaking about the workshop objectives, Dr. Imtiaz Rabbani said the aim of the workshop was to train participants on animal handling for different diseases module. He threw light on internationally accepted standards and procedures of research on animals. Various aspects will be discussed during the workshop related to introduction of lab animals and diseases of animals, scientific and ethical procedures for lab animals, humane method of killing, personal health and safety animal handling and general procedures etc.

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THREE-DAY GREYHOUND RACE CUP AT RACECOURSE GROUND, UNIVERSITY OF AGRICULTURE FAISALABAD.

Faisalabad: Three-day greyhound race cup began on Monday at Racecourse Ground, Jail Road, University of Agriculture Faisalabad.



Mian Mumtaz Manika, Khan Irshad Hussain Lodhi Punjab cup was arranged by Directorate of Farms. It was inaugurated by Commissioner Faisalabad Asif Iqbal along with University Farms Director Shahid Afzal Gill.

As many as 108 imported and countrybred greyhounds took part. The event remained a source of attraction for the locals who came here to entertain and get refuge from their routine life.

Asif Iqbal said that such event depicts the colors of the rural culture. He said that such events also give an opportunity to rural people to interact with agricultural experts.

Dr. Shahid Afzal said that it also provided the opportunity to the people to entertain and witness the greyhounds races.

He said that the university is used to hold such events to attract the rural population. Dr. Haroon Zaman also spoke on the occasion.

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ASSESSING THE THREAT OF AI

It may have been a quiet winter for avian influenza last year, but that doesn't mean the threat is gone. Poultry World reports.

Britain must invest more in preparing for a mass-scale avian influenza outbreak, according to new analysis. Daniel Roberts, author of the recently published Nuffield report Living and Dying with Avian Influenza, says that the UK would struggle to manage a major outbreak of the disease.



Mr Roberts' research took him to a number of countries that have suffered major outbreaks, including the US, Canada, the Netherlands and Hong Kong. A commonality in all countries was a lack of preparation ahead of a major incursion.

Major outbreak

And while there is a range of systems and procedures in place, it is Mr Roberts' contention that the UK "does not currently have the capability to contend with a major outbreak and needs to invest significantly in order to mitigate the risk of a devastating incursion".

Mr Roberts says such an incursion is inevitable, and preparing for it will require both improving current procedures, and considering the overall structure of the British poultry industry.

Backyard birds

To begin with, Mr Roberts identifies issues with backyard poultry and recommends that all keepers, regardless of flock size, be forced to join a register. "A solution must be found that

allows all flocks to be identified no matter how small." He cites a compulsory dog registration scheme in New Zealand as a potential model for this.

At the international scale, he suggests that the way backyard flocks are defined should be reviewed; for example, in the UK 'backyard' is fewer than 50 birds, but in France it is possible to keep up to 3,200 ducks with no need to register.

And Mr Roberts asks whether those backyard flocks could be classed as wild birds, removing the need for notification on the OIE website, potentially allowing countries to erect trade barriers unnecessarily.

Here in the UK focus must be applied to wild bird monitoring active surveillance is the most effective way to understand the current threat. The 'footprint' of avian influenza in Europe also provides a precursor to potential incursions in the UK.

Tough questions need to be asked as to how we balance intensification versus Al risk versus human health.

Living and Dying with Avian Influenza, by Daniel Roberts, is available for download on the Nuffield website.

REGIONAL COUNTRIES SHOULD FORMULATE A WORKABLE POLICY FOR SUSTAINED ECONOMIC GROWTH IN THE WAKE OF ENHANCED CONNECTIVITY IN THE SHAPE OF CPEC COUPLED WITH RESTORATION OF PEACE IN SOUTH ASIA



Faisalabad: Regional countries should formulate a workable policy for sustained economic growth in the wake of enhanced connectivity in the shape of CPEC coupled with restoration of peace in South Asia, said Syed Zia Almdar Hussain president Faisalabad Chamber of Commerce & Industry (FCCI).

Addressing a function on CPEC-Gateway to progress, Prosperity and Connectivity organized by ACCA (Association of Chartered Certified Accountants) he said that no doubt connectivity will spur economic opportunities but at the same time it will widen gap and competition between the developed and under developed countries of the region.

"In this disadvantageous situation, the under developed countries would have to harness their skills to compete with their developed neighbors", he said and apprehended that they would become only a market for the surplus production of developed countries if they failed to improve their production sector.

He told that there is hell of difference between the economic parameters of countries falling within the region and we must concentrate to upgrade the technologies of the under developed countries otherwise the scale of economy of china will badly effect the industry and SME sector of other countries. He stressed the need for joint ventures with Chinese companies so that the issues of technology transfer and liquidity problem could be solved simultaneously. He told that China's rapidly growing economy is expected to top the rest of the world's economies by 2050. He further said that "Belt and Road" is a big initiative for Pakistan. It includes many mega projects including 21st Century Maritime Silk Route, Bangladesh-China-India-Myanmar Economic Corridor, China-Mongolia-Russia Economic Corridor, China-Central Asia-West Asia Economic Corridor, China-Indochina Peninsula Economic Corridor.

Continuing, he told that Faisalabad's GDP is projected to rise to US\$ 37 billion in 2025 at a growth rate of 5.7% which is higher than the growth rates of 5.5% predicted for Karachi and 5.6% for Lahore. He further told that in the 7th meeting of Joint Cooperation Committee, it was agreed that the contents and vision of CPEC would be expanded and three more pillars including Agriculture, Poverty alleviation, and People to People exchanges would be added to the existing four pillars, which are

energy, infrastructure, transport and railway, and Swat Port. He further told that realizing the opportunities and challenges of CPEC, the FCCI has constituted a special Standing Committee on CPEC which had published a comprehensive Study Report on 'CPEC-Opportunities and Challenges' in mid of 2017. A Chinese Help Desk has also been set up at FCCI in addition to arranging Chinese Language Courses for the FCCI members intending to deal with china in the fast changing regional environment.

He said that there are new opportunities are also cropping up for the Chinese Companies to launch joint ventures and double trading opportunities particularly in Agriculture machinery and equipment, Establishment of recreational clubs and facility, Hotel construction, Solar Technology and Solar Cell Industry, Technical Testing Facilities, Livestock and Dairy Development, Milk processing, Fruits, Vegetables & Flowers Grading, Packing and processing etc.

He told that China Pakistan Economic Corridor (CPEC) also brings huge opportunities for Faisalabad due to its close proximity with the Eastern Route of CPEC.

Earlier president Faisalabad Women Chamber of Commerce & Industry (FWCCI) Madam Roobeena Amjad said that that Pakistan is strategically located in South Asian part of the continent which is the only option to link china with rest of the world including oil rich countries of Gulf and Arabia. She further said that we have to re-align our priorities to get maximum economic benefit from this modern Silk Road. She said that we have to involve our SME sector in this mega project of CPEC, which could grow through value addition and accreditation of technology in the years to come. She further suggested that we must explore ways and means to involve the 50% female population in productive economic activities. She told that FWCCI has already launched an aggressive sensitization program to convince Women Entrepreneurs and activists to be a part of this modern Silk Road as unlimited opportunities are waiting for them under this project.

The meeting was also attended by Mr. Sajjad Aslam, Head of ACCA Pakistan, Mr. Muhammad Shahid Khan, Head Central Region, Mr. Shah Muhammad Khan, Business Development Manager Faisalabad, Senior Vice President FWCCI Miss Hanifa Javid and Vice President Miss Urwa Nabeel.

GU HEALTH IN POULTRY: A HOLISTIC APPROACH



The impressive genetic improvement of broiler growth rates has enabled the poultry industry to meet with a worldwide increased demand for poultry meat. Compared to broiler production in the 1950-1960s, birds today grow twice as fast. This improvement in growth and the corresponding feed conversion ratios has put enormous pressure on the digestive system of the birds. Therefore, it is essential to create a healthy intestine from the very beginning and to maintain optimal gut functions throughout the whole growth period to avoid enteric diseases, like necrotic enteritis (NE) and bacterial enteritis (BE) or dysbacteriosis. Any factor that compromises the integrity of the intestinal mucosa and its bacterial community will lead to decreased nutrient absorption. Additionally, activation of the immune system and processes, will cost valuable nutrients and energy. Considering all of the above, the financial success of the poultry business is directly dependent on intestinal health.

Because of the risk of antimicrobial resistance connected with consumer concern for animal welfare and food safety, recent pressure on the usage of antimicrobials has caused intense investigations to find alternative solutions to develop a healthy digestive system in animals without extensive use of antibiotics. Management changes and different alternatives for antibiotics such as probiotics, prebiotics, phylogenetic products, organic acids and enzymes have been investigated to improve intestinal health and general animal performance.

Microbiota interaction
In the past, the investigation of intestinal bacterial population has been done with *in vitro* culture techniques. These techniques are able to assess only those bacterial species that can be grown in different media in laboratory conditions. Recently, modern approaches using molecular techniques were able to show that a significant part of intestinal microbiota has never been cultured. So actually only a small fraction of intestinal bacterial population has ever been studied so far. Any conclusions regarding the composition of intestinal microbiota and its functions must be drawn very carefully. Use of modern molecular techniques has led to a better understanding of the role of microbiota in oral tolerance and physiological functions of a healthy gut and has helped a lot to disqualify simplistic views such as the existing of 'good' *Lactobacillus* spp. and 'bad' *Clostridium* spp. Bacteria. Nowadays, microbiota is considered as a gene tool box that is complementing the gene pool of the host. The research is focusing on unravelling the complex interactions of what kind of gene pool is linked with good gut health and understanding how genes, both from the gut and its microbiota, can be switched on and off with different diet types, in order to reach the best performance, lowest level of inflammation, best digestive and absorptive properties. What we know so far, is that a composition of intestinal microbiota is changing throughout the life cycle of an individual, becoming quantitatively and qualitatively more complex with the age. Also environmental factors, such as stocking density, diet composition and feeding practices, management, housing conditions, pathogen load in the environment, use of antibiotics, can modify intestinal microbiota. Feed withdrawal, especially over longer time, causes reduction in the number of detected bacterial species. Also from one segment of the gastrointestinal tract to the other, bacterial populations of the gut vary significantly. In the small intestine of a healthy bird, *Lactobacillus* spp. are dominant, whereas in caeca *Clostridium* spp. are prevailing, which is connected with different pH and physiologic functions of these intestinal segments.

There are some members of the mucosa-associated microbial community that are considered to be especially crucial for a healthy status of the gut. These are bacteria producing short chain fatty acids, like acetic, propionic and butyric acid, during the fermentation process of dietary carbohydrates. Production of butyrate near the epithelial cells and in close association with invading and histotoxic pathogens promotes development and recovery of the villi, stimulates the expression of the tight junction proteins, limits invasion of pathogens such as *E. coli* and *Salmonella* and further promotes a beneficial microbial ecosystem, which leads to an overall increased tissue health. On the contrary, mucine-degrading bacteria and sulphate reducers create hydrogen sulphide, which enhances some pathogens and causes tissue damage, see Figure 1.

Figure 1 Macroscopic dysbacteriosis scoresystem parameters.
• A. Overall gut ballooning;
• B. Content of the intestinal tract, 1. Mucoid, orange intestinal content, 2. Foamy intestinal content;
• C. Tonus of the intestinal tract, 1. Good tonus, 2. Lack of tonus;
• D. Macroscopically visible thickness of the intestinal tract, 1. Macroscopically thin intestinal tract, 2. Intestinal tract with normal thickness;
• E. Undigested particles in the colon (arrows); F. Inflammation of the gut, 1. Inflammation, 2. No inflammation.

Vicious circle of bacterial enteritis

Since the ban of antimicrobial growth promoters in Europe in 2006, digestive problems such as BE or dysbacteriosis and even necrotic enteritis have increased. The aetiology of BE is multifactorial, in modern broiler breeds, selected for maximal growth rate and high feed intake, abundance of non-absorbed nutrients in the gut lumen, in absence of growth promoters with antibacterial properties, causes a chain of events that exacerbates the proliferation of some clusters of bacteria that leads to an inflammatory reaction of the gut wall. This reaction of the gut wall in its turn instigates microscopic and macroscopic changes that, as in a vicious circle, will lead to poorer physiologic status of the intestine and to poor digestive and absorptive functions, resulting in even more nutrients in the intestinal lumen, and more substrate for bacterial growth.

The pathogenesis of BE can be described as a vicious circle in 4 steps
1. In the first step, the shift of the healthy gut towards BE starts with overconsumption of nutrients in the intestinal lumen. In today's broilers, the very high feed intake has accelerated the general feed passage rate in the intestine. So, even minor violations of the digestion and absorption will lead to an increase in the number of nutrients, especially of undigested proteins and high-energy nutrient particles in the hind gut. Among gut damaging factors of infectious origin, *Coccidiosis* is considered to be the most important, but also virus infections can destroy intestinal epithelia, shorten intestinal villi and lead to poor absorption of the intestine. The stressors of non-infectious origin are dietary changes, nutritional imbalance, soluble non-starch polysaccharides (NSP), enzymatic dysfunctions, *myxotoxins* and management issues.

2. As a consequence of the overconsumption of nutrients in the intestinal lumen, a shift in proliferation of some clusters of bacteria occurs in the small intestine in step 2 of the vicious circle. The presence of excessive nutritional factors mainly favours the proliferation of *Clostridium perfringens* and *Lactobacillus* and disfavors certain *Clostridia*.

3. In step 3, this disruption of a very fine balance in gut microbial constellations may shift intestinal immune tolerance towards pathological inflammation reactions and oxidative stress in the gut wall, so morphological and functional alterations in the intestine occur. In case of overgrowth of *Clostridium perfringens* spp. producing NetH toxin, these alterations even result in necrotic enteritis, as NetH toxin directly destroys the intestinal lining.

Strategic use of additives and medication
The choice of best (so called traditional and alternative) solutions should be tailor made for each operation, looking at the 4 steps of the vicious circle and what contributing factors are causing damage to intestinal health.

Solutions work on different parts of the cycle. Some products have antagonistic, some additive and some have a synergistic effect. Some products will go through the drinking water, some will go through feed or can be sprayed on the chicks or grown in the environment.

Examples of traditional additives are antimicrobial growth promoters, antibiotics, feed enzymes, antiparasitics, *coccidiostats*, vaccines, acids used as feed preservatives, *myxotoxin* binders. Exams of alternatives are acids used to steer gut microbiota, probiotics, etheric oils, bacteriophages, betagluconans. In fact the differentiation is very artificial, as some products can be part of either category, and the ones that are alternative now will be standard in a few years' time. Therefore I opt not to discriminate and just categorise all of them as gut health support tools.

It all starts with understanding
The objective is to define what tools are relevant in terms of efficacy and cost for your operation. It all starts with understanding where your BE cycle is fuelled from. Usually it will be a complex combination of changes, but with a good starting diagnosis of your flock you will understand where the low hanging fruit is. *Coccidiosis* for instance is very often the primary instigator of the BE cycle. The levels at your farm can be very different from neighboring farms and understanding this can help you to define if you need to invest more in *coccidiostats* control or maybe if you can save some money that can be used to fight other challenges such as *myxotoxins*, microbiota shifts, inflammation at level of gut or dealing with litter quality issues. On the other hand, if your *coccidiosis* levels are higher than average, it is very unlikely that the best return on investment will yield from adding a probiotic in drinking water. Changing the anticoccidial programme will for sure give you the best results as *coccidiostats* will have a direct impact on performance, but also reducing *coccidiosis* levels will lead to less fuel for your BE cycle.

Impact of gut health tools on performance
So it all starts with making a good diagnosis of what is going on by using scoring methods to define the levels of gut health challenge. Once we will be able to tell what is being done already to support gut health and estimate a cost per kg bird produced. This cost can then be analysed to understand where breaking the BE cycle can be most successful and where it will be less broken and importantly at what cost. Choosing gut health support tools then becomes an easier task, with usually a huge impact on performance and ease of growing birds and very importantly with lower cost of gut health support tools but also lower FCR and higher ADG.

In poultry production, intestinal health is capital for performance. Since the ban of antimicrobial growth promoters over 10 years ago in the research has shown the importance of general health on the intestinal microbial community and the complex interaction with the host. Intestinal health can be improved feed composition, medication and additives to create a rich and diverse microbial community, and to control the host reaction through dietary immunomodulation.