

# Synthesis

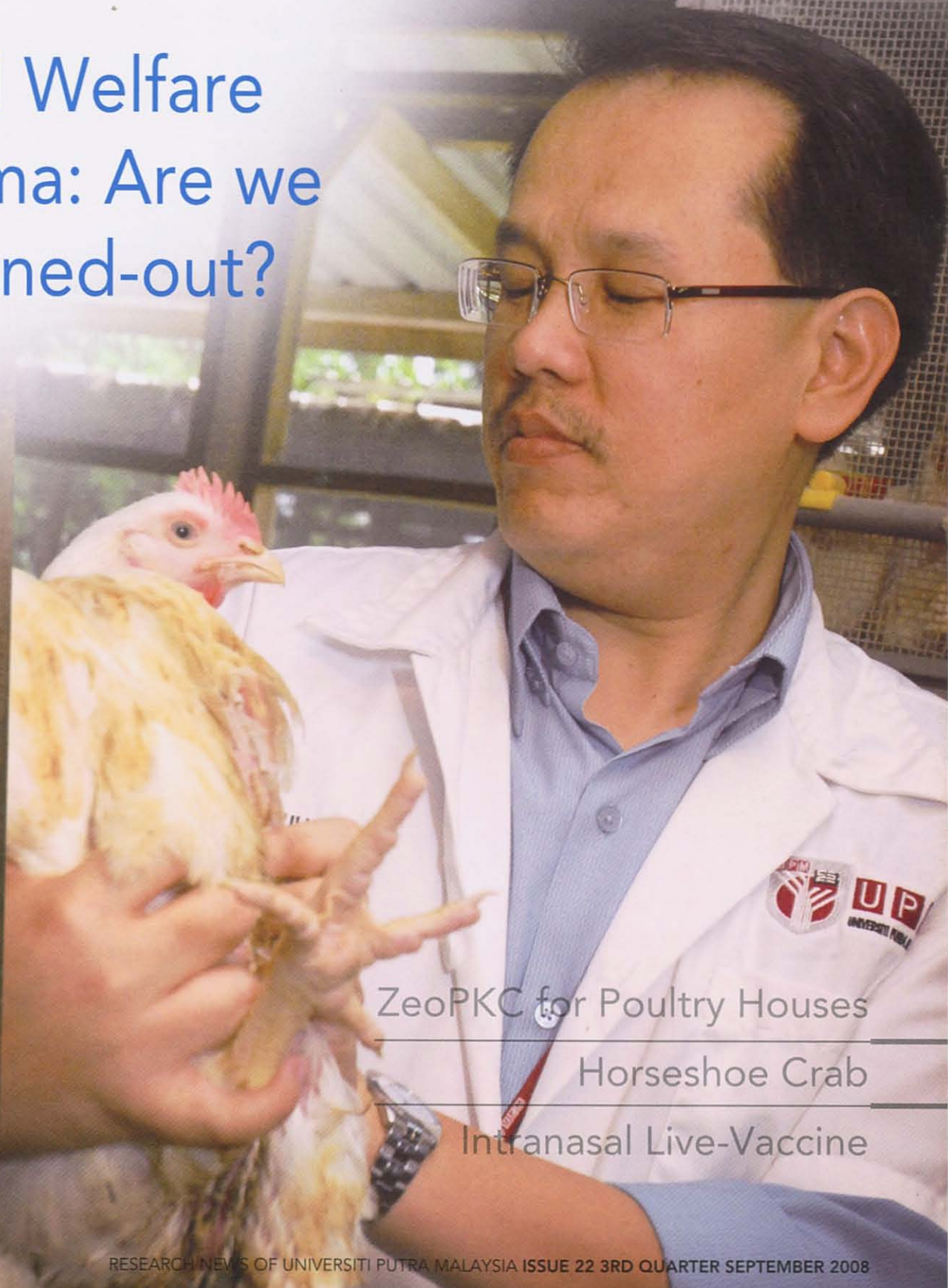
where great innovations come to life

ISSN. 0127 - 9394



<http://rnc.upm.edu.my/synthesis>

## Animal Welfare Dilemma: Are we Chickened-out?




ZeoPKC for Poultry Houses


Horseshoe Crab


Intranasal Live-Vaccine


# In this Issue


Editorial Spotlight 3

 Cover Story  
• Animal Welfare Dilemma: Are we Chickened-out? 4&5


 • ZeoPKC: An Additive to Control Ammonia Production in Poultry Houses 6

 • Horseshoe Crab, a Fossil Invertebrate Cultured for the Future 7

 • Intranasal Live-Vaccine – Alternative Concept for Control of Haemorrhagic Septicaemia in Cattle and Buffaloes 8

 • New Distribution Records of Sergestid Shrimp, *Acetes intermedius* (Decapoda: Sergestidae) from Peninsular Malaysia with Notes on its Population Characteristics 9

Research Happenings 10&11

 • Environmental Significance of Natural Sources of Trifluoroacetic Acid (TFA) 12

Feature 13

Reportage 14&15

ICC Reports 16, 18  
• What cannot be patented?  
• UPM Receives RM 20.8 million Commercial Grant from MTDC

• Pertanika Call for Papers 17

Back Issues 19

## What's Next

Highlights for the next issue –

- ▷ Bioremediation of Textile Dye
- ▷ RNPeptiZyme
- ▷ Compost Tea
- ▷ Oil Palm Herbal Tea

## Editorial Board

Patron	Professor Nik Mustapha Raja Abdullah
Advisor	Professor Abu Bakar Salleh
Executive Editors	Professor Zulkifli Idrus Professor Dato' Mohamed Shariff Mohamed Din Professor Fakhru'l-Razi Ahmadun
Managing Editor	Nayan Deep S. Kanwal (Dr.)
Sub Editor	Diyana Nawar Kasimon
Reviewers	Professor Kaida Khalid A.Prof. Adzir Mahdi A.Prof. Irmawati Ramli A.Prof. Mohd Said Saad
Photographer	Saleha Haron
Secretary	Azmi Mohd. Nordin
Online Webmaster	Mohamad Hafiz Mohamad Zamri

## Are you reading your own copy of the UPM R&D Digest?

*Synthesis* is the first and only quarterly R&D digest at Universiti Putra Malaysia published in March, June, September and December with the focus on award-winning innovations. It covers research happenings emerging from the various faculties and institutes across the university and provides a brief summary of some of the important research findings of the study conducted at UPM. It brilliantly features special topics that are of national interest in various fields and disciplines.

Scientists must be made aware of how important the impact of their work is and its possible applications on society and public opinion. It is hoped that this digest will provide the opportunity to interact particularly through feedback or direct mail to the scientist from either the private sector or by scientists from other government research institutions.

*Synthesis* is the official research bulletin of the University and is published by Research Management Centre. It is available free of charge to the academic community.

### Readership

Researchers, academicians, postdoctoral researchers, technicians, postgraduate studentships, research institutions, techno-entrepreneurs, venture capitalists and laypeople.

If you would like to receive a copy of the *Synthesis* for research updates every 4 months, or would like further information about Research Management Centre, please contact at the address given on this page or send an e-mail message to [ndeeps@admin.upm.edu.my](mailto:ndeeps@admin.upm.edu.my) with the only content in the body of the email message being "subscribe synthesis" to be added to the mailing list.

### Letters to the Editor

If you have any comments about the content of the publication or any contributions that you may wish to make for the forthcoming issues, please send them to: The Managing Editor, *Synthesis*, Publication Unit, Research Management Centre, 4th Floor, Administration Building, 43400 UPM, Serdang, Selangor, Malaysia or via the Internet to [ndeeps@admin.upm.edu.my](mailto:ndeeps@admin.upm.edu.my). The editor reserves the right to edit articles for clarity and space before publication.

The opinions and views expressed in this publication are not necessarily those of *Synthesis* or the Research Management Centre (RMC). Acceptance and publication of articles in this publication does not imply recommendations by RMC.

The publisher of *Synthesis* neither endorses nor is responsible for the accuracy or reliability of any opinion, advice or statement published in this digest. Under no circumstances will the publisher of this digest be liable for any loss or damage caused by your reliance on the advice, opinion or information obtained either explicitly or implied through the contents of this publication.



# Editorial

## R&D through Exhibitions!

Conducting research generally involves a lot of effort, energy, time as well as money. Research can be in form of inventing new products, formulating new solutions to solve existing problems or as simple as improving or proving current theories. It doesn't matter which area a research belongs to, the purpose of the "brainy job" is always similar: to serve as a means for the betterment of society.

Therefore it is vital to get the research publicised vigorously. One of the best platforms to realise this idea is by participating regularly in exhibitions conducted at national and international level. Apart from prizes offered, one of the main advantages of participating in an exhibition is the larger audience that can be reached out via these kind of activities. For young researchers especially, they should grab these golden opportunities as much as possible. They as well will have chance to demonstrate their projects "live" to the targeted public.


For that reason, the Promotion Division of Research Management Centre (RMC) needs to be congratulated for its great effort of organising the Invention, Research & Innovation Exhibition (PRPI 2008) in July recently (Refer to page 14 for news).

Besides motivating the researchers to actively participate in research exhibitions through small competitions at the university level, it also lays the groundwork to pick "fresh from the oven" research projects that would represent UPM at exhibitions and competitions held nationally and internationally.

RMC would like to take this opportunity to extend heartiest congratulations to all winners of PRPI 2008 especially to all the recipients of special awards and in particular to Associate Professor Dr. Tengku Aizan Tengku Hamid from the Institute of Gerontology for winning the highest number of gold medals. Bravo!

To date, UPM is proud to have an excellent track record of solid outstanding performance nationally and internationally. UPM was the biggest winner of Malaysia Technology Expo (MTE) 2008 after scoring 30 medals early this year, which was totally a great kick-start of the year! The success kept flowing flourishingly for UPM after sweeping 10 awards for Invention, Innovation & Technology Exhibition (ITEX) in Kuala Lumpur; 5 awards for International Exhibition of Inventions, New Techniques & Products of Geneva (Geneva-Palexpo), in Switzerland; and 6 medals for Invention & New Product Exposition (INPEX) in Pennsylvania, USA recently. Keep it up!

There are a few more yearly international exhibitions to eye for this year: British Invention Show (BIS) in London, UK from 15-18 October 2008 and Innova Energy in Brussels, Belgium from 13-15 November 2008. It is hoped that the researchers are completely ready for the next challenge. On behalf of the academia, RMC wishes the participants good luck and may the success keep flowing for this year!

The heat is on! Let's be thrilled! 

Diyana Nawar Kasimon  [diyana.kasimon@gmail.com](mailto:diyana.kasimon@gmail.com)



# Spotlight

## Plagiarism = Kidnap

The word plagiarism comes from a Latin word for kidnapping. Kidnapping can be referred to as stealing a person. Well, plagiarism is stealing a person's ideas or writing as someone's words and thoughts are personal property, too. One dictionary defines plagiarism as 'the appropriation or imitation of the language, ideas, and thoughts of another author, and representation of them as one's original work'.

Plagiarism is a serious academic offence and the consequences are severe. Unacknowledged direct copying from the work of another person or the unacknowledged close paraphrasing of somebody else's work is equated with cheating in examinations or in the world of scientific publishing. This applies to copying both from someone's work and from published sources such as websites, books, reports or journal articles. The degree of plagiarism could be as mild as the copying of a single sentence from another author without acknowledgement, or could involve much more extensive 'lifting of material' from other sources, including previous publications of the author.

The major forms of scientific misconduct are captured by three words: *fabrication*, *falsification* and *plagiarism*. Their meanings are self-evident. The first two forms are most likely to be detected by the rigorous peer review process instituted by all professional journals of quality. In those cases where a mendacious piece of work escapes detection and gets published, we can hope that later work by other scientists will expose the original misconduct.


### Tips on Avoiding Plagiarism

Use of quotations or data from the work of others is entirely acceptable, and is often very valuable provided that the source of the quotation or data is given. Failure to provide a source or put quotation marks around material that is taken from elsewhere gives the appearance that the comments are ostensibly one's own. When quoting word-for-word from the work of another person quotation marks or indenting (setting the quotation in from the margin) must be used and the source of the quoted material must be acknowledged.

Paraphrasing when the original statement is still identifiable and has no acknowledgement, is indeed plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable to put together unacknowledged passages from the same or from different sources link these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is also a form of plagiarism.

Direct quotation from an earlier piece of the student's own work, if unattributed, suggests that the work is original, when in fact it is not. The direct copying of one's own writings qualifies as plagiarism if the fact that the work has been or is to be presented elsewhere is not acknowledged. Sources of quotations used should be listed in full in a bibliography at the end of the piece of work.

To sum up, plagiarism is unacceptable and deserves exposure and an appropriate level of penalty. In case it is inadvertently published, a paper containing plagiarised material steals credit from the original source and erodes confidence in the quality and reliability of the journals.

Several measures should be instituted for all academic journals. Every case of suspected plagiarism brought to the attention should be investigated objectively and transparently by the journal editors speedily. If plagiarism is detected during the refereeing process, apart from immediate rejection the editorial board of the journal should consider steps commensurate with the seriousness of the case. In those situations where plagiarism is proven after publication, appropriate announcements should be placed, both online and in the next possible print issue of the journal. The journal's board should reserve the right to bring such instances to the attention of the author's funding agencies and also to inform the original author (where applicable) whose work has been plagiarised and journal from where the plagiarised material has been taken. 

Managing Editor  [ndeeps@admin.upm.edu.my](mailto:ndeeps@admin.upm.edu.my)

# Animal Welfare Dilemma: Are we Chickened-out?

The concern on animal welfare has risen since decades ago. It has generated public interest and become a hot debate ever since the British MP Richard Martin, who was also an Irish politician and animal rights activist bravely called out through Parliament offering protection from cruelty to cattle, horses and sheep as its central concern in 1822. Earning himself the nickname *Humanity Dick*, he also emphasised on human morality and humane behaviour.

Synthesis is delighted to feature an expert in Animal Stress Physiology and Welfare, Professor Dr. Zulkifli Idrus to address this much talked about issue. Dr Zulkifli's high interest in animal welfare has made him a well-known researcher and speaker nationally as well as internationally. According to him, the awareness on animal welfare can be generated through education, talks and conferences, round table discussions, courses offered at universities and even when the children are still at tender age.



Tracing back the history, one may ask what exactly "animal welfare" means and what it signifies? To put in purely plain words, animal welfare is all about caring for animals, preventing suffering as well as improving their living conditions. Concern for animal welfare seems to be determined significantly by people's perception of animal suffering and how they interpret what they see or measure in terms of animal behaviour or changes on physiological processes. To some people "animal welfare" means adequate well-being of the animals while they are alive. Many people may feel that the slaughter of animals is necessary and acceptable because they see no other alternative if they want to eat meat. But to others, concern for animal welfare requires a stop to eating meat. Caring for animals also associates with another important tendency: an understanding of animal behaviour. In fact, the concern on animal welfare too has become part of teachings in every existing religion in this world from time immemorial. The beautiful religion of Islam has always viewed animals as a special part of God's creation. Cultural differences however are more complex to explain.

This article attempts to focus on farm animal welfare, which is the most neglected category. In most cases, these animals are somehow seen as the "products" of human being that are eventually used for consumption as well as converted into other tangible goods and, therefore they are treated in an unfair manner compared to pets and wildlife. Though the issues on farm animal welfare have heated many debates, discussions and forums, the real question is how many people are actually aware of this matter, or do we really care about it in reality? It sounds rather ironic!

*"The greatness of a nation and its moral progress can be judged by the way its animals are treated."*

– Mahatma Gandhi

Generally, the cruelty on farm animal can be classified as abusive and negligence as well as boredom and restrictive surroundings. The difference between the two categories will be briefly explained later in this article. Nonetheless it is essential to know that the similarity of the two is they involved emotion and cognition of the animals which contribute tremendously to cruelty on them as well as stress and deprivation.

Now, let's take a look at the first taxonomy: abusive and negligence. There are a number of factors that lead to abusing and neglecting of the farm animals. The main cause of this problem is that we are more fretful about dollars and cents. For instance to meet the production demands, pigs and chickens are reared in a mass quantity which may cause health and behavioural problems as a result of overcrowding. In addition, intense genetic selection for rapid growth usually can lead to musculoskeletal disorders in chicken and arthritis among pigs as well as excitable temperament in some animals. These animals are prone to panic or injury when handled during auctions, feedlots or slaughter plants. Studies have also shown that excitable animals produce poorer meat quality.

Another example of action that can promote cruelty in handling farm animals is the sloppy management in dairy industry which results in high number of downer non-ambulatory cows. According to some study, approximately 10% of the dairies are responsible for 90% of the downed crippled cattle! The only solution to prevent downers is by encouraging good management which also averts other problems like milk fever, calving paralysis and foot problems.




Animal cruelty also can be constituted through boredom and restrictive surroundings. Commonly, animals that are kept in cages and sheds do not get chances to exhibit their natural behaviour and their movement is very limited at the same time. Tail biting in pigs and feather pecking in chickens are some of the most common abnormal behaviours as a result of stress and boredom. Beak trimming, a common practice in the poultry industry to control feather pecking problem, however may result in both acute and chronic pain. Animals that are "forced" to live in a restrictive environment also have lack of roughage feeds due to unnatural feeding patterns which leads to great discomfort to the animals. This problem exists especially in broiler-breeder chickens and sows where they have to be kept on a calorie restricted diet to prevent them from getting too fat to breed.

To provide a "stress-free environment" for animals is almost impossible, and can be impractical. Therefore the goal is to minimise unnecessary stresses imposed on animals. Management of human-animal interactions has been shown to be an effective tool to dampen stress and fear responses. Dr Zulkifli and his team were the first to demonstrate that pleasant contact with human beings leads to reduced stress and fear reactions in poultry, by enhancing their ability to express heat shock proteins in the brain. One of the most important functions of heat shock proteins is to protect living organisms from the adverse effects of stress. In many respects, good treatment of animal benefits both the animals and the farmers. After all, it works like a "fair exchange"; they provide meat, milk and eggs in return!

The cost of protecting the welfare of farm animals could heighten the food prices. Welfare-friendly products tend to cost more; on the production side, the producer has to take decisions regarding housing and husbandry systems. The question remains about the willingness of Malaysian consumers to pay the increase in the price of food to ensure adequate well-being of farm animals.

In addition, it is quite obvious that people are more concerned for the welfare of some species than others. For example the welfare of a giant panda matters more than that of a dog and the welfare of a dog more than that of a chicken. This could be attributed to factors such as usefulness, fondness towards a particular animal, attractiveness, size, visibility, rarity, companionship and familiarity. The vast scale on which farm animals are raised may have desensitised all parties associated with livestock and poultry. It is very important for producers and consumers to bear in mind that farm animals are living organisms that possess feelings, and are not machines or mere economic units.

Farm animal producers in the European Union (EU) are presently facing the task of ensuring higher welfare standards to comply with the regulations laid down in the EU Directive. According to Dr Zulkifli, the majority of concerns relating to livestock industry in Malaysia and other developing countries are to produce cheap, plentiful food in a profitable manner. In order to resolve the welfare problems of farm animals, the industry must first see them as problems in animal agriculture. Major advances in understanding animal welfare will come through scientific research and development. Research and development can provide reliable information to the society, and it is the society who ultimately dictates the direction and standards of farm animal welfare. 



### Expert's snapshots

Professor Dr. Zulkifli Idrus is currently a lecturer at the Department of Animal Science, Faculty of Agriculture. In addition, Zulkifli is the Director of Research Management Centre, UPM. His areas of expertise include Animal Stress Biology and Welfare, and Poultry Management and Nutrition. He has been a guest speaker for numerous talks and conferences concerning farm animal welfare nationally and internationally. To date, he has more than 68 scientific publications in refereed journals to his credit. In recognition of his expertise in Animal Welfare research, he was appointed researcher and consultant to the World Society for the Protection of Animals (WSPA), and Meat and Livestock Australia. He also has supervised nearly 20 postgraduate students and has won a number of research awards throughout his career. Zulkifli can be reached at +603-8946 6028 or via email at zulkifli@agri.upm.edu.my

# ZeoPKC: An Additive to Control Ammonia Production in Poultry Houses



Ammonia production and house fly population in traditional poultry houses are problems that affect productivity and create unhealthy working environment.

The use of organo-chemicals such as pesticides can be a health hazard to those working in the farms. Poultry manure which is high in nitrogen coupled with moisture provide excellent breeding grounds for houseflies, which not only lay eggs and produce larvae that populate the manure and cause foul odour and ammonia production. In practice, farmers spray the manure

accumulated under the layer cages with chemicals to kill adult flies and larvae. However, regular spraying can create a health hazard and increased costs. Broiler chickens raised on deep litter can also be affected by this problem, especially on floor areas that are subject to moisture, for example near water dispensers. Chemicals are not used in broilers on deep litter and farmers usually remove the affected litter, which can be quite laborious.

At UPM we have developed a method as an alternative to applying chemicals. ZeoPKC is a product that is added to the feed that helps

reduce the moisture content of the manure.

ZeoPKC contains among others, palm kernel and zeolite, both have adsorptive characteristics. Both zeolite and palm kernel has




*ZeoPKC—a safe and healthy alternative that can just be mixed in the poultry feed*

water binding capacity, reduces moisture content of manure, subsequently lowering breakdown of uric acid to ammonia and reduces breeding grounds for flies. This additive when included in poultry diets at levels ranging from 2.5 – 5.0 % is effective in reducing moisture content of manure by more than 40%, and ammonia emission by more than 30%.

This product is especially useful for layers in cages or broilers in deep litter system, in open or close house system or range system. Other added advantages for layers include:

- Improved egg shell quality;
- In addition to being safe and healthy, it provides additional nutrients, such as calcium and antioxidants to the layers;
- It is easy to use, can just be mixed in the feed.

ZeoPKC is proven to be environmentally friendly and cost effective. It is suitable for organic farming system. It is formulated to contain zeolite, palm kernel cake, antioxidants and other useful nutrients. In addition, it absorbs moisture which predisposes to fly larvae, reduces emission of NH<sub>3</sub> from faecal nitrogen and is value added organic manure. 

*Effect of ZeoPKC on Ammonia emission (ppm), Moisture (%) and pH in manure, and on the Performance of Layers*

Layers	NH <sub>3</sub> (ppm)	Fly larvae (no. m-1)	Moisture (%)	pH
Control	21.33	126	77.3	6.69
ZeoPKC	15.63	100	68.5	7.01

Layers	FI (g/d)	FCR	Egg %	Egg Wt.
Control	108.0	2.63	75.7	54.4
ZeoPKC	108.5	2.66	75.0	54.0



*ZeoPKC—An additive to control ammonia and flies in poultry houses*

 **GOLD** International Invention, Innovation, Industrial Design Technology Exhibition (I-TEX 2007)



## Reader Enquiry

**Abdul Razak Alimon**, Wihandoyo, Kassim Hamid and Ismail Idris

Department of Animal Science, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia  
Tel: 603-8946 6891 E-mail: ralimon@agri.upm.edu.my

# Horseshoe Crab, a Fossil Invertebrate Cultured for the Future

Horseshoe crab, locally known as "belangkas", is a fossil animal that dates back to more than 445 million years. The four known surviving species of horseshoe crabs are *Limulus polyphemus*, *Carcinoscorpius rotundicauda*, *Tachypleus tridentatus* and *Tachypleus gigas*. *L. polyphemus* is found in the North and Central America, while the remaining 3 species are found in Asia (namely India, Thailand, Indonesia, China, Hong Kong, Japan and Malaysia). For many years, considerable quantities of horseshoe crab caught in Malaysian waters were exported to Thailand where they are used in cooking exotic delicacies in the restaurants.

Horseshoe crabs are benthic, found mostly at estuarine and continental shelf. It plays an important role in the ecological equilibrium of a coastal environment. Survey carried out between 2004 and 2006 along the coastal fishermen villages in Peninsular Malaysia and Sabah indicated that the population of these invertebrates is declining fast. This is mainly due to the development of coastal areas, land reclamations, pollution and over harvesting by the locals. It takes about 9 years for Horseshoe crab to reach maturity. Upon attaining this stage, this horseshoe crab will come ashore to spawn, at this time they are harvested for their eggs by the fishermen.

Except for being a distinctive fossil species, these horseshoe crabs were of no importance until a few years ago when a commercially important product called Limulus Amebocyte Lysate (LAL) derived from the blood of *L. polyphemus* was discovered. LAL is being used in the pharmaceutical and biomedical industries to test the safety of intravenous solutions and antibiotics. Since then more research has been carried out to find if other beneficial substances can be derived from the horseshoe crab's blood. Scientists at Universiti Putra Malaysia (UPM) in 2006 discovered that the two local horseshoe crab species, *C. rotundicauda* and *T. gigas*, can be a potential source of antibacterial compounds. To allow further research in this area, horseshoe crab is now being produced and cultured in the laboratory at UPM.

The success in artificial fertilisation has led to the development of culture system for horseshoe crab. For the first time, a compact recirculating system (Figure 1) was designed for the purpose of incubation of eggs and the rearing of horseshoe



Figure 1: A compact recirculation system for the rearing of the horseshoe crab larvae




Figure 2: The incubation of horseshoe crab eggs



Figure 3: Horseshoe crab juveniles cultured in laboratory condition

larvae. The system consists of polyethylene trays, arranged to resemble drawers which can be pulled out to monitor and for the maintenance purposes. These trays are fitted with tubing to allow the supply (from a reservoir tank) and outflow of water (to a mechanical-biofilter), then through an ultraviolet steriliser and finally being pumped back into the reservoir. This system incorporates the use of mechanical-biofilter and ultraviolet to maintain good water quality and eliminate pathogen. Horseshoe crab culture requires seawater; therefore this system prevents water wastage and reduces cost for the continuous supply of seawater.

Newly inseminated horseshoe crab eggs can be kept incubated (Figure 2) in these trays until hatching (in 30 to 45 days), and continue with the rearing of the larvae. This system will be able to support thousands of eggs and hundreds of larvae until they are 2 years old. It is a viable and practical system which requires minimal maintenance. The compact design only occupies a very small space and can easily be expanded by adding more trays to accommodate higher numbers of eggs and larvae.

Presently, culture of horseshoe crab larvae and juveniles (Figure 3) are being maintained in the laboratory and observed for its growth. It is hoped that this success will lead to further findings on its utilisation to contribute towards the future science and mankind. 



- **SILVER** International Invention, Innovation, Industrial Design Technology Exhibition (I-TEX 2008)
- **GOLD** UPM Invention, Research & Innovation Exhibition (PRPI 2007)
- **GOLD** UPM Invention, Research & Innovation Exhibition (PRPI 2006)
- **Bronze** International Exposition of Research & Innovation of Institutions of Higher Learning (PECIPTA 2007)
- **Travel Grant Award** United States Geological Survey for the International Symposium on the Science and Conservation of Horseshoe crab in New York, USA (2007).
- **Travel Grant Award** United Nation for the UNITAR Seafood Security Workshop in Hiroshima, Japan (2006)

## Reader Enquiry

**Annie Christianus**, Sharr Azni Harmin and Latifah Hussin

Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia  
Tel: 603-8946 4111 E-mail: annie@putra.upm.edu.my, anniechr@yahoo.com

# Intranasal Live-Vaccine – Alternative Concept for Control of Haemorrhagic Septicaemia in Cattle and Buffaloes



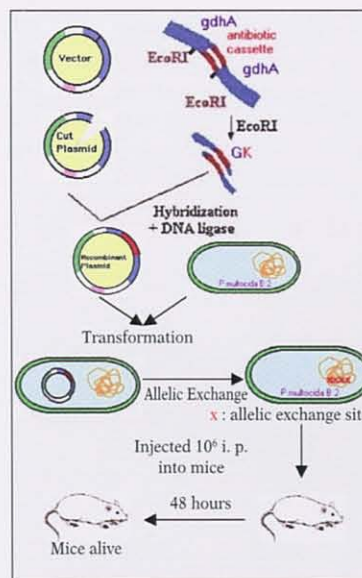
A buffalo calf that died of haemorrhagic septicaemia

Haemorrhagic septicaemia (HS) is an important disease of cattle and buffalo caused by *Pasteurella multocida* B:2. It kills animals within a short period of time without obvious clinical symptoms. A locally produced injectable vaccine has been used since 1960s to control the disease but with little effect. This is due to the difficulties in injecting the vaccine into buffaloes that are semi-wild and which keep roaming between states in Malaysia. Therefore, the low vaccination coverage among the semi-wild buffaloes leads to disease outbreaks that may kill between 100 and 400 buffaloes in each outbreak. Since buffaloes that survived natural infection were found to have strong and lasting immunity, a live vaccine that uses an attenuated, less virulent organism may provide superior protection. Furthermore, intranasal delivery of the live attenuate vaccine may be highly effective in preventing infection, not only among those vaccinated but also among those animals that intermingle with the vaccinated buffaloes.

An attenuated *Pasteurella multocida* B:2 was invented in UPM by disrupting the *gdhA* gene of virulent field isolate of *Pasteurella multocida* B:2. This was then used in preparation of a live attenuated vaccine for haemorrhagic septicaemia. When 2mL of the live attenuated vaccine were sprayed into the nostrils of a group of buffaloes, all were found to be protected from the disease. When another group of susceptible buffaloes were allowed to commingle with the buffaloes that were vaccinated intranasal, between 70 and 100% of the commingled

buffaloes were also protected from the disease. Protective antibodies were high in both groups of buffaloes.

These observations confirmed our theory that the live attenuated vaccine, given intranasal to a group of buffaloes can be transmitted naturally into another group of commingling buffaloes, resulting in self-vaccination and protection of most buffaloes. This concept, when used in the field, can dramatically increase the vaccination coverage among the semi-wild, roaming buffaloes leading to lesser outbreaks of haemorrhagic septicaemia among cattle and buffaloes. **RMC**



Procedure that disrupt the *gdhA* gene of *Pasteurella multocida* B:2 and used to prepare live attenuated vaccine against haemorrhagic septicaemia



Laboratory apparatus used in the preparation of the vaccine

● GOLD International Exposition of Research & Innovation of Institutions of Higher Learning (PECIPTA 2007)



## Reader Enquiry

M. Zamri-Saad, M.Y. Sabri, Z. Zunita and A.A. Saharee

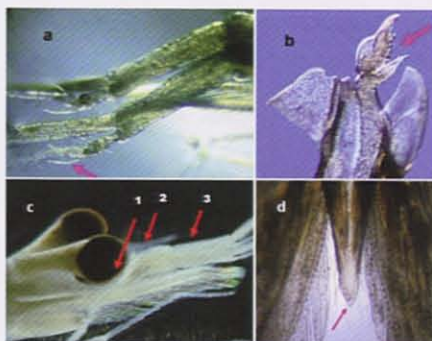
Department of Veterinary Pathology & Microbiology, Faculty of Veterinary Medicine, Universiti Putra Malaysia, Serdang, Selangor, 43400 UPM, Malaysia  
Tel: 603-8946 8312 E-mail: zamri@vet.upm.edu.my



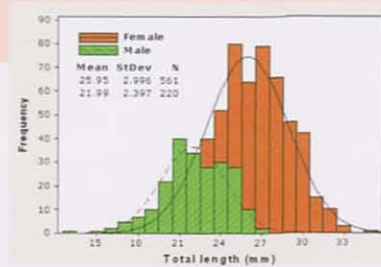
# New Distribution Records of Sergestid Shrimp, *Acetes intermedius* (Decapoda: Sergestidae) from Peninsular Malaysia with Notes on its Population Characteristics

The sergestid shrimp *Acetes* (locally known as 'udang geragau') which is found in the coastal region of Malacca supports a considerable subsistence fishery. *Acetes intermedius* is one of five important commercial shrimp species found in the shallow coastal waters of Malaysia. Species of the genus *Acetes* live in the estuaries and coastal waters of the tropical and subtropical regions. *Acetes* range from 10-40 mm in total length and are widely distributed in the world. They are major economically important shrimps in Asia and East Africa waters. During certain parts of the year, they form conspicuous aggregations near the shoreline and are fished mainly with push net and fixed bag net that is set near the shore against the flow of the tide. The fishing is generally done during the day time. In many Asian countries, only a small proportion of the catch is marketed as fresh shrimps; the greater proportion is dried, salted or fermented in various forms of food. Shrimp paste and sauce are manufactured extensively throughout Southeast Asia due to its esteemed taste and nourishment.

During a detailed study of the systematic of the genus *Acetes* H. Milne-Edwards, specimens of *A. intermedius* were observed in the samples collected from the west coast of Peninsular Malaysia. The species is referred to as *A. intermedius*. Research conducted by UPM scientists provides description on its morphological characteristics together with some other biological aspects including population structure, growth, sex ratio and length-weight relationship. A taxonomic account of this shrimp is also provided. Notes on its habitat and population characteristics were examined based on 995 specimens collected from the Klebang Besar, coastal waters of Malacca, Peninsular Malaysia during February 2005 to January 2006. In the males, lower antennular flagellum is 13 or 14 segmented with one clasping spine (Figure 1a). The petasma is equipped with pars astringens and capitulum of petasma with 4 subsequently large hooks along outer margin (Figure 1b). The coxa of the third pereiopod lacks a tooth on the distal inner margin. Appendix masculine hold 3 hooks. In females, first segment of antennular peduncle at most as long as second and third segments combined (Figure 1c). The lower antennular flagellum is 12-15 segmented. The basis of the third pereiopod has a small projection on the distal inner margin. There is a pair of distinct protuberances on the anterior part of the third thoracic sternite; the sternite is concave in the



**Figure 1:** *Acetes intermedius* Omori. a, clasping spine (x30); b, petasma (x40); c, segments of antennular peduncle (x20) (female) (1-1st segment, 2-2nd segment; 3rd-segment) and d, apex of the telson triangular (x30) (male).



**Figure 2:** Annual length-frequency distribution of males and females of *A. intermedius* collected from the coastal waters of Malacca



*Acetes intermedius* specimens of Malacca coastal waters

median part and is not produced backwards. There is a small procurved tooth between the bases of the first period in both females and males. The apex of the telson is sharply pointed and triangular (Figure 1d). There is a red spot on the proximal part of the endopods of uropod.

Size-frequency distribution revealed that the mean size of females consistently exceeded that of males throughout the year (TL range: 15–27.50 mm and 13.50–33 mm for males and females respectively). Total number of individuals collected for this study was 269 (27.04%) for male and 726 (72.96%) for female respectively (Figure 2). The mean total length of female was 2.40 mm larger than that of the male, and it was significantly different (t-test,  $P < 0.001$ ). The overall yearly and the monthly sex ratio were in favor of the females. In general, sex ratio is known to be close to 1:1 (females: male) in nature but in *A. intermedius* population of the coastal waters of Malacca, it was in favor of females in most of the months of the years. The sex ratio by size class (CL) showed a clear predominance of female's number in the lower sizes (< 19 mm) and also in the larger size classes (> 22 mm). Males dominated the intermediate size classes (19–21 mm)

Asymptotic length ( $L_{\infty}$ ) and growth co-efficient (K) was estimated as 34.65 mm and 1.50 yr<sup>-1</sup>. The exponent b (2.979) of the length-weight relationship for males was found near to the isometric value ( $b = 3.0$ ) and positive allometric growth was observed in females and combined sexes ( $b = 3.227$  for females and  $b = 3.249$  combined sexes). The sizes attained by *A. intermedius* were 7.66 mm, 13.63 mm, 18.28 mm, 21.90 mm, 24.72 mm and 26.92 mm at the end of 2, 4, 6, 8, 10 and 12 months of age respectively. The calculated average growth rate of *A. intermedius* for the first six months was 2.86 ( $\pm 0.58$ ) mm/month and in the following six months it was 1.35 ( $\pm 0.27$ )/month. The asymptotic weight was calculated as 211.21 mg. The overall average growth rate of *A. intermedius* showed 2.10 ( $\pm 0.88$ ) mm/month in the coastal waters of Malacca. The present specimens afford the first subsequent record of the species *A. intermedius* and extend considerably the range of distribution, being the first to be known from the coastal waters of Peninsular Malaysia. **RMG**



Microscopic examination of *A. intermedius* for taxonomic validation



- **GOLD** UPM Invention, Research & Innovation Exhibition (PRPI 2008)
- **SILVER** UPM Invention, Research & Innovation Exhibition (PRPI 2008)
- **Bronze** UPM Invention, Research & Innovation Exhibition (PRPI 2007)

## Reader Enquiry

**Aziz Arshad**, S. M. Nurul Amin, Siti Shapor Siraj and Japar Sidik Bujang

Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia  
Tel: +603 8946 4118, 012-430 3677. Email: azizarshad@putra.upm.edu.my



**UPM R&D Exhibition (PRPI 2008) (29-31 July 2008)**

- 1. MAGNIFICENT:** The splendid scene of PRPI 2008!
- 2. QUALITY FIRST!:** Professor Abu Bakar Salleh receiving the MS ISO 9001:2000 certificate from Professor Dato' Nik Mustapha R. Abdullah, witnessed by Dato' Seri Mohamed Khaled Nordin.



- 3. THIS IS WHAT I'M TALKING ABOUT:** A/P Dr. Tan Bee Hoon's brilliant research had impressed many during the exhibition.
- 4. RED CARPET:** (Clockwise) UPM's Chairman Tan Sri Dato' Dr. Syed Jalaluddin Syed Salim, Minister of Higher Education Dato' Seri Mohamed Khaled Nordin and UPM's Vice Chancellor Professor Dato' Nik Mustapha R. Abdullah and Deputy Vice Chancellor (Research & Innovation) Professor Abu Bakar Salleh.



**UPM-Elsevier Publishing Seminar 2008 (24 July 2008)**

- 1. SAYING IT OUT LOUD!:** (from left) Robert Gorter, Louise Morris, Professor Dato' Mohamed Shariff, Professor Tan Soon Guan, Linda Chan, Jo-an Chia and Janice Chia.
- 2. CAUGHT IN ACTION!:** The outstanding presentations during the seminar had grasped Professor Zulkifli Idrus's attention!
- 3. PERTANIKA ALWAYS A PRIORITY!:** Dr Nayan Kanwal, Executive Editor, *Pertanika Journals* (centre) explaining the importance of *Pertanika Journals* to Louise Morris, guest speaker while Prof. Jamuar, Chief Editor JST listens attentively.



**National Academic Award (24 July 2008)**

- 1. BEST OF THE BEST!:** UPM's Chairman Professor Emeritus Tan Sri Syed Jalaludin Syed Salim, the recipient of National Academic Personality Award 2007.
- 2. FOR THE BETTERMENT OF PADDY:** A/P Dr. Syed Omar Syed Rastan receiving the trophy of Product Commercialisation Award from Malaysian Prime Minister Datuk Seri Abdullah Badawi.

# Research HAPPENINGS



## Malaysian International Food & Beverage 2008 (12-14 July 2008)

1. **JAM ON IT!:** Dr. Rosnah Shamsuddin demonstrating the operation of her latest invention: a jam making machine.
2. **JOLLY:** The mascots had certainly helped to brighten up the atmosphere at MIFB 2008!



## Invention & New Product Exposition (INPEX) (11 -14 June 2008)

1. **FLYING HIGH:** The winners of INPEX 2008 looking rejoiced after finding out that their hard work had finally paid off!
2. **TAKING PHOTOS, MAKING MEMORIES!:** UPM's delegate photographed at the INPEX, USA!



## Down the Memory Lane (Newsmakers around the campus)

1. **BUSY BEE:** Some of the hectic scenes at the UPM-Elsevier Publishing Seminar 2008!
2. **ONE MILLION DOLLAR SIGNATURE!:** Elsevier's Regional Sales Director SE Asia & Pacific, Robert Gorter signing the Certificates of Participation on behalf of Elsevier.
3. **FROM UPM WITH LOVE!:** Professor Dato' Mohamed Shariff presenting a souvenir to Robert Gorter, Elsevier's Regional Sales Director SE Asia & Pacific.
4. **GRATEFULNESS:** Professor Ghizan Salleh presenting a token of appreciation to Professor Emeritus Paul Siegel during one of the international academic writing workshops.
5. **UPM'S ROSE:** Professor Datin Paduka Khatijah Mohd Yusoff exchanging views with Professor Zulkifli Idrus (left) and Professor Abu Bakar Salleh on how to transform UPM into Malaysia's best university!
6. **COURTESY VISIT:** Professor Dr Abu Bakar Salleh showing his gratitude to A/P Dr. Peter Mather from Queensland University of Technology for his support towards *Pertanika*.

# Environmental Significance of Natural Sources of Trifluoroacetic Acid (TFA)



Collection of water sample from Langat dam

Ever since its discovery in 1922, trifluoroacetic acid (TFA) has proved to be a significant chemical with very distinctive properties. While it smells like acetic acid, it is a much stronger acid - much more reactive and a better solvent - with an interesting list of uses. TFA provides a way to introduce trifluoromethyl groups into more complex molecules. This compound has been used in the production of pharmaceutical and agricultural chemicals, as well as in many other specialised applications. It is used in peptide synthesis and as a solvent and catalyst in polymerisation and condensation reactions. Trifluoroacetic acid,  $\text{CF}_3\text{C(O)OH}$  is a strong organic acid with  $\text{pK}_a$  of 0.23 and it is miscible with water (solubility over 10000 g/l) TFA is a stable ion in the aqueous phase with no significant loss process such as hydrolysis, photolysis, or formation of insoluble salts.

Trifluoroacetic acid is an intermediate of medicines, agricultural chemicals, and the acrylic resin. It also serves as the chemical reaction acylating agent, the heat pump fluid, and one kind of important solvent. The reactions of TFA are centered around the carbonyl group. On the other hand, the trifluoromethyl group is one of the most stable organic structures. It is inert toward practically all oxidising, reducing and hydrolysing conditions and *in vivo* metabolism. The carbonyl group provides a way to attach the trifluoromethyl group to other molecules.

TFA is used as an esterification and transesterification promoter and can also be used to protect active amino groups temporarily. In fact, it can be mixed with other acids, or Lewis acids, to generate modified catalysts useful in olefin/alkane reactions in petroleum refining steps. These catalysts reduce by-product sludge and increase yields when compared to the more conventional catalysts.

TFA is miscible with most organic solvents and it will dissolve limited quantities of lower alkanes. Fluorinated solvents, even perfluorocarbons, are completely miscible with TFA. Polyamides and polyesters are soluble and the solutions can be used for analytical purposes or to perform reactions on the polymers. TFA will cause severe burns to the skin, eyes, mucous membranes and other exposed tissues because of its strong acidity and fast tissue penetration. It does not exhibit poisoning due to fluoride ion or any toxicity resembling that of monofluoroacetic acid. Due to its high solubility, TFA can accumulate in plants via roots uptake of water. This phenomenon is supported by experimental data which demonstrate that TFA is a xylem mobile herbicide, transported through the stem and accumulated in leaves.

The mineralisation of acetate to carbon dioxide is a key link in the biogeochemical carbon cycle. Therefore it is essential to know whether TFA, which is structurally close to acetate, could interfere with acetate metabolism. The results suggested that TFA at concentrations with several orders of magnitude higher than those anticipated in the environment have no impact on the acetate mineralisation on carbon

dioxide and consequently does not affect incorporation of acetate into cellular material. The effect of TFA has been investigated in free-living nitrogen-fixing bacteria. The experiments were designed to determine whether TFA was specifically toxic to nitrogen fixation. No effect of TFA on growth or  $\text{N}_2$  fixation with ammonium ion as nitrogen source was noted at concentrations as high as 100 ppm TFA. It has been shown that TFA has no effect on methanogenic environments where acetate is an important intermediate.

The environmental risk of TFA as degradation product of CFCs substitutes can be deduced from the value of the ratio of exposure to effect or of Predicted Environmental Concentrations to Predicted No Effect Concentrations (PEC/PNEC). To derive a PEC, production and releases of parent compounds, along with rates of transformation into TFA, have been modelled. A range of concentrations in rain water has been calculated, taking into account geographical variations (OH radical concentrations, amount of rain, regional releases of parent compound). A rough average concentration of 0.1  $\mu\text{g/l}$  in rainwater, by the year 2020, is taken as a global PEC. But an important question remains concerning the origin of the large current levels of TFA which have been measured in the environment (fresh and marine surface waters, rain and air) and which cannot be explained by the known industrial sources.

A new novel method has been developed to analyse TFA in environmental samples using strong acid media, nucleophilic substitution reaction which occurs between  $\text{CF}_3\text{COO}$  and dimethyl sulphate (DMS). TFA will fully ionise in sulphate media, then reacts esterifiably with DMS with high speed, and produce Methyl trifluoroacetic acid (MTFA) which can be determined by GC-MS quantitatively. The solubility of MTFA in strong acidic media is low, and the volatility of MTFA is high (boiling point 43°C. In the temperature of 45°C, the reaction can reach equilibrium, and MTFA can be concentrated and analysed through headspace injector. **RMC**



Water from the river to a reservoir for major treatment



Water analysis process



● GOLD UPM Invention, Research & Innovation Exhibition (PRPI 2007)

## Reader Enquiry

**Mohammad Reza Mohammad Shafiee**, Mohamad Pauzi Zakaria, Mahyar Sakari, Pourya Shahpoury Bahry

Department of Environmental Sciences, Faculty of Environmental Studies, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia

Tel: +603 8946 6738 / 016 664 6247 E-mail: dr\_shafiee@yahoo.com

This is the second part of the continuing series of this feature article.  
The first part was published in *Synthesis Issue 21 (June 2008)*.

# Guidelines for Pollution in Drinking Water

Mohammad Reza Mohammad Shafiee, Mohamad Pauzi Zakaria, Nayan Deep S. Kanwal, Mahyar Sakari, Pourya Shahpoury Bahry and Alireza Riyahi Bakhtiari

Water pollution is one of the major and serious health threats to the environment as well as human beings.

There are several pollutants that are a threat to the drinking water and they can be classified in six categories. i.e.

- Microorganisms;                      ■ Disinfectants;                      ■ Disinfection byproducts;
- Inorganic chemicals;                ■ Organic chemicals; and            ■ Radionuclide's

These form the potential pollutants to human drinking water worldwide. The current guideline provides necessary information on these threats. In this issue of *Synthesis*, information is provided for the second and third category that focuses on Disinfectants and Disinfection byproducts.

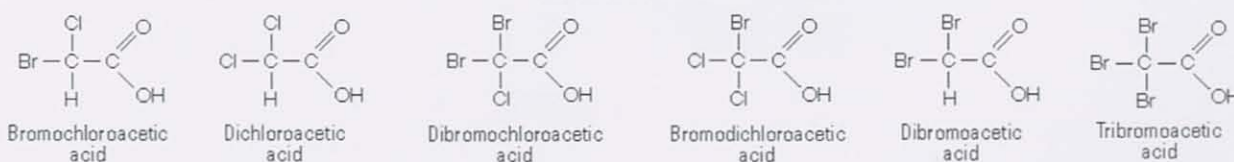
## Disinfectants

Contaminant	MRDLG <sup>1</sup> (mg/L)*	MRDL <sup>2</sup> (mg/L)	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Chloramines (as Cl <sub>2</sub> )	4	4.0	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes
Chlorine (as Cl <sub>2</sub> )	4	4.0	Eye/nose irritation; stomach discomfort	Water additive used to control microbes
Chlorine dioxide (as ClO <sub>2</sub> )	0.8	0.8	Anemia; infants and young children: nervous system effects	Water additive used to control microbes

## Disinfection Byproducts

Contaminant	MCLG <sup>3</sup> (mg/L)*	MCL <sup>4</sup> (mg/L)	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Bromate	zero	0.010	Increased risk of cancer	Byproduct of drinking water disinfection
Chlorite	0.8	1.0	Anemia; infants and young children: nervous system effects	Byproduct of drinking water disinfection
Haloacetic acids (HAA5)	n/a <sup>5</sup>	0.060	Increased risk of cancer	Byproduct of drinking water disinfection
Total Trihalomethanes (TTHMs)	n/a	0.080	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection

### Haloacetic acids



### Definitions:

<sup>1</sup> Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Treatment Technique - A required process intended to reduce the level of a contaminant in drinking water.

<sup>2</sup> Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

<sup>3</sup> Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.

<sup>4</sup> Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

<sup>5</sup> n/a, not available

\*Units are in milligrams per liter (mg/L) unless otherwise stated. Milligrams per liter are equivalent to parts per million (ppm).

....to be continued in *Synthesis Issue 23, December 2008*.

# NewsBriefs



## PRPI 2008: A Memorable Episode!

UPM annual exhibition, Invention, Research and Innovation Exhibition (PRPI 2008) was held recently at Sultan Salahuddin Abdul Aziz Shah Arts and Cultural Centre from 29 - 31 July 2008.

Themed "Inculcating High Impact Research", PRPI was organised by the Office of Deputy Vice Chancellor (Research & Innovation) to promote new research outcomes and findings that have potential to be commercialised.

The exhibition also serves as the preliminary stage before those new researches are selected to represent the university at any national and international exhibitions through a small competition among the researchers.

Director of Institute of Gerontology, Associate Professor Dr. Tengku Aizan Hamid nailed the highest number of gold medal for that day: three gold medals in total. A special award was given each to Associate Professor Datin Siti Nor Akmar Abdullah (INPEX, USA), Dr. Tinia Idaty Mohd Ghazi (IENA, Germany) and Professor Muzafar Shah Habibullah (INNOVA, Belgium) for their outstanding achievements in the previous international exhibitions.

Higher Education Minister Dato' Seri Mohamed Khalid Nordin presented the awards to all winners during the closing ceremony.

It was also a joyous occasion when SIRIM QAS International Sdn. Bhd. Managing Director, Dato Mariani Mohamed presented the MS ISO9001:2000 certificate to Prof. Datuk Dr. Nik Mustapha R. Abdullah on behalf of the Office of Deputy Vice Chancellor (Research & Innovation), witnessed by Dato' Seri Mohamed Khaled bin Nordin.



## UPM Researchers Dazzle at Malaysia Nuclear Innovation Award 2008

Three UPM researchers were honoured after winning three medals for their ground breaking research projects during Malaysia Nuclear Innovation Award 2008 which was held in conjunction with Nuclear Agency Innovation Day recently.

Organised by Malaysian Institute for Nuclear Technology Research (MINT), the ceremony took place at Malaysian Nuclear Agency, Bangi from 16-18 July 2008.

Dr. Iqbal Saripan from the Faculty of Engineering walked away with a gold medal, a trophy and a cash of RM1000 for his cutting edge research on "Early Breast Cancer Detection using Wire Mesh Collimator Gamma Camera". The lecturer from the Department of Computer System and Communication Engineering said that the research will help to improve the effectiveness and quality of the image using the new collimator structure for early cancer and tumour detection.

Concurrently Associate Professor Dr. Mohd Basyarudin Abd. Rahman and Professor Elias Saion, both from the Faculty of Science won a silver and bronze medal respectively for their impressive research.

The award giving ceremony was officiated by Director General of MINT Datuk Dr. Daud Mohamad.

Nothing is more ecstatic than being honoured nationally as well as recognised internationally. For that reason, two UPM academicians have an appropriate reason to share their success stories with the rest of the UPM academia. Chairman of the UPM Board of Directors, Professor Emeritus Tan Sri Dr. Syed Jalaludin Syed Salim was named as the recipient of the National Academic Personality Award 2007 during the prestigious National Academic Award 2007.

Dr. Syed Jalaludin, who is also currently the Chairman of Bank Rakyat as well as the former Vice-Chancellor of UPM, was chosen as the 2007's Academic Personality based on his tremendous contribution in research and development (R&D), and other sectors namely national higher education, science and technology and humanity. He is also a well known persona amongst international and national scholars for his great effort in the development of Veterinary Sciences in Malaysia.

## UPM Academicians Win Top Awards at National Academic Award

The creator of ZAPPA®, Associate Professor Dr. Syed Omar Syed Rastan was honoured with Innovation



and Product Commercialisation Award for his remarkable contribution in paddy plantation in Malaysia.

ZAPPA®, the world's first technology for paddy seeds saturation had also won the Invention and Innovation Award 2002 from the Ministry of Science and Environment Malaysia (MOSTE) and international award at Geneva, Switzerland in 2004.

The memorable event was held on 25 July 2008 at Putrajaya International Convention Centre (PICC) to commemorate outstanding academicians from various universities nationwide.

research papers in international refereed journals.

The seminar that was held on 24 July 2008 at the Auditorium, Faculty of Engineering, Universiti Putra Malaysia was officiated by Director, Research Management Centre (RMC).

The seminar was mesmerised by six speakers: Professor Dato' Mohamed Shariff and Professor Tan Soon Guan from UPM, and Robert Gorter, Louise Morris, Jo-an Chia and Linda Chan from Elsevier.

With assorted topics presented, the seminar had successfully attracted more



### UPM-Elsevier Publishing Seminar 2008: A Real Success!

Getting scientific papers published in international journals is seen as the most recent trend worldwide. To keep up with the global demand, UPM and Elsevier made a brilliant effort by organising an international publishing seminar on "Becoming a Successful Journal Author" which targeted aspiring young lecturers and researchers who aim to publish their

than 300 enthusiast participants from various faculties as well as other external institutions. The seminar also went pretty interactive and exciting as the participants were allowed to ask questions during and after each presentation.

For those who missed the seminar, the presentation slides of each presenter are downloadable at <http://asia.elsevier.com/authorworkshop08/upm/>.

Well done UPM and Elsevier!



### The Colourful MIFB 2008!

Malaysia is in its aggressive effort of catering halal food to the world as well as creating business opportunities to the potential entrepreneurs. With the similar aspiration, UPM had joined the league by participating Malaysia International Food & Beverage Trade Fair (MIFB) 2008 to promote its products to the potential clients recently.

The 10th MIFB 2008 was held from 9-11 July 2008 at Putra World Trade Centre, Kuala Lumpur to step up efforts of becoming the net food exporter by 2010.

UPM managed to draw the visitor's attention by promoting its Mengkudu Leaves Fruits and Green Tea which is believe to be natural Anti-obesity Agents, Rice Drinks production, Jam Maker Machine and Hypercholesterolemia Oil.

The colourful and vibrant exhibition as well had successfully attracted various local and international manufacturers and entrepreneurs worldwide.

### Six Medals for UPM at INPEX 2008

UPM won two gold, three silver and one bronze medals at Invention & New Product Exposition (INPEX) 2008 held at David Lawrence Convention Centre, Pittsburgh, Pennsylvania, USA recently.

The 24th America's Largest Invention Trade Show that was held from 11-14 June 2008 was represented by five UPM researchers.

Director of Institute of Bioscience Professor Fatimah Md. Yusoff who was represented by Professor Dato' Mohamed Shariff Mohamed Din and Dr. Osumanu Haruna Ahmed from the Faculty of Agriculture and Food Sciences, UPM Bintulu Campus walked away with two medals each (a gold and

silver) for their outstanding projects.

In addition to the winning, Associate Professor Dr. Mohd. Basyaruddin Abdul Rahman from the Faculty of Science and Associate Professor Dr. Ishak Aris from the Institute of Advance Technology (ITMA) bagged a silver and bronze medal respectively.

Malaysia was honoured to be given the biggest partaking this year by sending fifty one participations and eighty one products from twelve private and government higher education institutions.



## What is a Patent?

A patent is an exclusive right granted for an invention, which is a product or a process that provides a new way of doing something, or offers a new technical solution to a problem. Generally, a patent is protected 20 years from the date of filing and a utility innovation is protected 10+5+5 years from the date of filing on proof of working.

## What cannot be Patented?

Researchers should have an understanding of several key definitions related to inventions and intellectual property. The following section describes, that not all ideas are 'inventions;' not all individuals involved in the development of inventions are 'inventors;' and not all inventions are patentable. Under the Malaysian Patents Act 1983, inventions may not consist of;

### 1. Discoveries, scientific theories, and mathematical methods;

- Mere discovery of new knowledge or new physical or chemical effect in the world is not patentable;

e.g.:

- i. Discovery of the effect of electric current from a battery on a frog's leg
- ii. Newton theory of gravity or theory of relativity

### 2. Plant or animal varieties or essentially biological processes for the production of plants or animals, other than man-made living micro-organisms, micro-biological processes and the products of such micro-organism processes;

- Any new animal or plant varieties through genetic engineering cannot be patented;

e.g.:

- i. A process for production of plants or animals
- ii. If it consists entirely of natural phenomena
- iii. Such as crossing or selection
- iv. Essentially biological Process

### 3. Schemes, rules or methods for doing business, performing purely mental acts or playing games:

e. g.:

- i. Scheme for learning a language
- ii. Method for solving a crossword puzzle,
- iii. Method of learning a language
- iv. Method of teaching /learning

### 4. Methods for the treatment of human or animal body by surgery or therapy, and diagnostic methods practiced on the human or animal body.

e.g.:

- i. Removal of cancer tumor
- ii. Removal of dental plaque and carries
- iii. Surgical processes
- iv. Processes relating to therapy
- v. Method of vaccination,
- vi. Blood transfusion



#### For more information, please contact;

Intellectual Property Division, Innovation and Commercialisation Centre (ICC), UPM  
- 03-8947 1298 / ipr@icc.upm.edu.my



# Pertanika

Our goal is to bring high quality research to the widest possible audience

Pertanika  
is Indexed in  
Scopus &  
EBSCO

Pertanika is an international peer-reviewed leading journal in Malaysia which began publication in 1978. The journal publishes in three different areas — Journal of Tropical Agricultural Science (JTAS); Journal of Science and Technology (JST); and Journal of Social Sciences and Humanities (JSSH).

**JTAS** is devoted to the publication of original papers that serves as a forum for practical approaches to improving quality in issues pertaining to tropical agricultural research or related fields of study. It is published twice a year in **February** and **August**.

**JST** caters for science and engineering research or related fields of study. It is published twice a year in **January** and **July**.

**JSSH** deals in research or theories in social sciences and humanities research with a focus on emerging issues pertaining to the social and behavioural sciences as well as the humanities, particularly in the Asia Pacific region. It is published twice a year in **March** and **September**.



## Call for Papers

Pertanika invites you to explore frontiers from all fields of science and technology to social sciences and humanities. You may contribute your scientific work for publishing in UPM's hallmark journals either as a **regular article**, **short communications**, or a **review article** in our forthcoming issues. Papers submitted to this journal must contain original results and must not be submitted elsewhere while being evaluated for the Pertanika Journals.

Submissions in English should be accompanied by an abstract not exceeding 300 words. Your manuscript should be no more than 6,000 words or 10-12 printed pages, including notes and abstract. Submissions should conform to the Pertanika style, which is available at [www.rmc.upm.edu.my/pertanika](http://www.rmc.upm.edu.my/pertanika) or by mail or email upon request.

Papers should be double-spaced 12 point type (Times New Roman fonts preferred). The first page should include the title of the article but no author information. Page 2 should repeat the title of the article together with the names and contact information of the corresponding author as well as all the other authors. Page 3 should contain the abstract only. Page 4 and subsequent pages to have the text - Acknowledgments - References - Tables - Legends to figures - Figures, etc.

Questions regarding submissions should only be directed to the Executive Editor, Pertanika Journals.

Remember, *Pertanika is the resource to support you in strengthening research and research management capacity.*



An Award Winning  
International-Malaysian Journal

FEB. 2008

Why should you publish in Pertanika Journals?

### Benefits to Authors

**PROFILE:** our journals are circulated in large numbers all over Malaysia, and beyond, in Southeast Asia. Recently, we have widened our circulation to other overseas countries as well. We will ensure that your work reaches the widest possible audience in print and online, through our wide publicity campaigns held frequently, and through our constantly developing electronic initiatives through e-pertanika and Pertanika Online.

**QUALITY:** Our double-blind peer refereeing procedures are fair and open, and we aim to help authors develop and improve their work. Pertanika JTAS is now over 30 years old; this accumulated knowledge has resulted in Pertanika JTAS being indexed by Scopus (Elsevier).

**AUTHOR SERVICES:** we provide a rapid response service to all our authors, with dedicated support staff for each journal, and a point of contact throughout the refereeing and production processes. Our aim is to ensure that the production process is as smooth as possible, is borne out by the high number of authors who publish with us again and again.

**LAG TIME & REJECTION RATE:** the elapsed time from submission to publication for the articles in Pertanika averages 6-8 months. A decision of acceptance of a manuscript is reached in 1 to 3 months (average 7 weeks).

Our journals have a 30% rejection rate of its submitted manuscripts, many of the papers fail on account of their substandard presentation and language (frustrating the peer reviewers).



Mail your submissions to:

The Executive Editor  
Pertanika Journals  
Research Management Centre (RMC)  
Publication Division  
4th Floor, Administration Building  
Universiti Putra Malaysia  
43400 UPM, Serdang, Selangor, Malaysia

Tel: +603-8946 6192  
[ndeeps@admin.upm.edu.my](mailto:ndeeps@admin.upm.edu.my)  
[www.rmc.upm.edu.my/pertanika](http://www.rmc.upm.edu.my/pertanika)

## UPM Receives RM 20.8 million Commercial Grant from MTDC



Malaysian Technology Development Corporation (MTDC) was set up by the Government of Malaysia in 1992 to spearhead the development of technology businesses in Malaysia. Its initial role was to concentrate on the promotion and commercialisation of local research and invests in new ventures that can bring in new technologies from abroad. The objectives of the grant schemes are to encourage researchers and technopreneurs to commercialise research findings of local universities / research institutions.

### List of Special Commercialisation of Research & Development Fund (CRDF) Recipients

No	Project Title	Researcher	Amount (RM)
1.	Production of a New Novel Thermostable Lipase for Industrial Application	Prof. Dr. Raja Noor Zaliha Abd. Rahman Faculty of Biotechnology and Biomolecular Sciences	3.03 m
2.	Toxicity bioassay of heavy metals using the Xenoassay kit	Dr. Mohd Yunus Abd.Shukor Faculty of Biotechnology and Biomolecular Sciences	921 k
3.	Upgrading of Commercial Manufacturing Capabilities of the Fibre Reinforced Plastic Composite (FRPC) Production Using Kenaf ( <i>Hibiscus canabinus</i> ) Fibre for Interior Automotive Components	Assoc. Prof. Dr. Jalaluddin Harun Institute of Tropical Forestry and Forest Products	1.9 m
4.	Production of Palm Oil-Based Wax Esters Using Enzyme Technology	Prof. Dr. Mahiran Basri Faculty of Science	2.02 m
5.	Large Scale Kojic Acid Production via High Performance Fermentation Process using Locally Isolated Fungus	Prof. Dr. Arbakariya Ariff Faculty of Biotechnology and Biomolecular Sciences	1.4 m
6.	Production of Biocompost from Organic and Agrowaste	Prof. Dr. Mohd Ali Hassan Faculty of Biotechnology and Biomolecular Sciences	1.49 m
7.	Up-scaling and Commercialisation of Bacteriocin Produced by Lactic Acid Bacteria Isolated from Malaysian Fermented Foods	Assoc. Prof. Dr. Foo Hooi Ling Faculty of Biotechnology and Biomolecular Sciences	3 m
8.	Commercialising E-Ory: Antioxidant Formulation From Agriculture Recycled Products	Prof. Dr. Maznah Ismail Institute of Bioscience	4.3 m
9.	Commercialisation of a recombinant NP- Elisa kit for the Identification of Newcastle disease virus	Prof. Dr. Aini Ideris Faculty of Veterinary Medicine	1.3 m
10.	Pilot Scale Production and Performance Evaluation of Real Time PCR Kits for the Detection of Economical Important Avian Viruses	Assoc. Prof. Dr. Abd. Rahman Omar Institute of Bioscience	1.4 m
<b>Total</b>			<b>20.8 m</b>

### Protect your technologies!

# WARNING !

Your invention can be **STOLEN** by someone!  
 You may **LOSE** your invention that **HAS BEEN DISPLAYED**  
**IN THE PUBLIC DOMAIN**  
 Somebody can steal it!

## Somebody can steal it!



To protect your invention please call ICC : 03-8947 1298 / 2055 or [ipr@icc.upm.edu.my](mailto:ipr@icc.upm.edu.my)

[www.icc.upm.edu.my](http://www.icc.upm.edu.my)

For UPM Staff  
Members

# Synthesis BACKISSUES

## SEPTEMBER 2006 — Issue 14, 3rd Quarter



- Editorial:** UPM continues its pursuit of excellence in education and research  
**Spotlight:** University Rankings  
**Research Highlight:** A New Centre to Promote Technology Transfer and Commercialisation – Innovation and Commercialisation Centre
- Regulars**
- ⊖ Detection of Microsatellite Loci in Rhinoceros Beetle *Oryctes Rhinoceros* Using the Randomly Amplified Microsatellites (RAMS) Method
  - ⊖ Carbon Dioxide Enrichment Technique for the Lowland Controlled Environment System
  - ⊖ Mitozyme™: Natural Enzyme Supplement for Poultry

- ⊖ LaSt 24: A Novel Nanocomposite -Based Controlled Release Formulation of Latex Stimulant
  - ⊖ MBzyme: Nanobiocatalyst as Catalyst for Green Organic Syntheses
  - ⊖ Cardamonin: a Drug-like Phytochemical with Anti-Inflammatory and Immunomodulatory Properties Research
- Research Happenings**
- ⊖ Biotechnology Asia 2006
  - ⊖ Agrobio Exhibition 2006
  - ⊖ IPTA R&D Roadshow 2006
  - ⊖ INPEX International Show 2006
- Reportage**
- ⊖ NewsBriefs
  - ⊖ FactFile

## DECEMBER 2006 — Issue 15, 4th Quarter



- Editorial:** Managing Knowledge  
**Spotlight:** Nation Building- the Role of Universities  
**Research Highlight:** Knowledge transcends borders – Teaching and learning a critical success factor...
- Regulars**
- ⊖ King Grass (hybrid Pennisetum) Silages- Quality and Digestibility
  - ⊖ Improvement Technology for Cocoa Butter Extraction Using Supercritical Fluid
  - ⊖ Trans- Free- Palm- Based Fluid Shortening
  - ⊖ Bluetooth Smart Remote Control and Sensor System (BLUESS)
  - ⊖ RAWAT: Rainwater Harvester

- ⊖ The Fabrication and Comparison of NiZn Ferrite Cores via Sol-gel Technique and Solid State Reaction
- Research Happenings**
- ⊖ NATPRO 2006
  - ⊖ PRPI 2006
- Reportage**
- ⊖ NewsBriefs
  - ⊖ FactFile

## MARCH 2007 — Issue 16, 1st Quarter



- Editorial:** Indicators of Research University Performance  
**Spotlight:** Web Presence & Development  
**Research Highlight:** Towards World-class University- What does it take to be a prestigious research institute?
- Regulars**
- ⊖ New Materials for our Industries: PANGIUM EDULE REINW. (Kepayang)- Any Takers for Development of Products?
  - ⊖ NMFeFrit™: Formulation- Tailoring of the Ni- Mg-Ca-Co-Cu-Zn-Fe Ferrite System to Attain Extremely Low Magnetic-Energy Loss for High-Frequency Application
  - ⊖ The Adoption of Econet: The Internet-Based Malaysian Ecotourism Network and Site Rating Expert System

- ⊖ RF Coaxial Cavity for Ignition
  - ⊖ Developing Ergonomics Seat for Commercial Vehicle in Malaysia: A Concurrent Approach
  - ⊖ A Family of Parallel Explicit Group Iterative Algorithm on Shared Memory
  - ⊖ Multiprocessors (SMPs) Architecture
- Research Happenings**
- ⊖ IENA 2006
  - ⊖ BIS 2006
  - ⊖ MAITREX 2006
- Reportage**
- ⊖ NewsBriefs
  - ⊖ FactFile

## DECEMBER 2007 — Issue 17-19, 4th Quarter



- Editorial:** Realisation of Quality Research Management System  
**Spotlight:** Reading a Scientific Paper  
**Research Highlight:** Maximising Research Potential through Quality Academic Publishing- Experts from Six Prominent Global Universities Shares Their Experiences
- Regulars**
- ⊖ A Computerised Digital Imaging Technique to Estimate Palm Oil Quality Based on Fruit Colour
  - ⊖ Natural Booster Kit for High Quality Microalgal Production
  - ⊖ A Long-term Triaxial Filtration Test System
  - ⊖ Oil Scan: Remote Oil Spill Detection, Classification and Trajectory

- ⊖ An Enhanced Mobile IPv6 with Multicast Function and Hierarchical Design
  - ⊖ Why Children and Teenagers are Addicted to Computer Games? NEMD Model- Norma™ Engagement Multimedia Design Model
- Research Happenings**
- ⊖ MTE 2007
  - ⊖ BIO International Convention 2007
  - ⊖ ITEX 2007
  - ⊖ INPEX 2007
- Reportage**
- ⊖ NewsBriefs
  - ⊖ FactFile

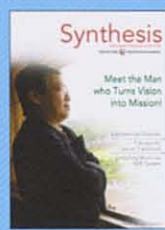
## MARCH 2008 — Issue 20, 1st Quarter



- Editorial:** UPM Honours its Researchers  
**Spotlight:** What is a Citation Index?  
**Research Highlight:** Shaping the First Class Professional
- Regulars**
- ⊖ Periphyton-Bacterial Complex: A Novel System for Improving Water Quality and Shrimp Postlarvae Survival without Water Exchange
  - ⊖ DNA Vaccine for Enterovirus 71
  - ⊖ Converging Thermal Wave Probe a.k.a. CTWaveProbe™
  - ⊖ A Novel Hybrid Spacecraft Attitude Control System

- ⊖ Surface Plasmon Resonance Biosensor Chip for the Detection of GMOs
  - ⊖ New Prospective Polyurethane/ Clay Nanocomposite for Fire Retardant to Complying Sustainable Development
- Research Happenings**
- ⊖ NATPRO 2008
  - ⊖ MTE 2008
- Reportage**
- ⊖ NewsBriefs
  - ⊖ FactFile

## JUNE 2008 — Issue 21, 2nd Quarter



- Editorial:** Facts and Figures...  
**Spotlight:** The Growing Importance of Research at Universities  
**Research Highlight:** Meet the Man who Turns Vision into Mission!
- Regulars**
- ⊖ Phenylalaline Ammonia Lyase, a Novel Marker for Colour in Commercial Orchids
  - ⊖ Harnessing a Natural Cyanide Generating System from Cassava Plant for Cancer Treatment
  - ⊖ An Efficient Mechanical Cell Disruptor for the Release of Hepatitis B Virus Capsid from Escherichia Coli

- ⊖ Synthesis of Novel Glutamate-Zinc-Aluminium - Layered Double Hydroxide Nanobiocomposites
  - ⊖ Content-based Music Retrieval with N-Grams and a Music-friendly Interface
- Research Happenings**
- ⊖ Geneva Palexpo 2008
  - ⊖ APC 2008
  - ⊖ Intellectual Property Day 2008
  - ⊖ I-TEX 2008
- Reportage**
- ⊖ NewsBriefs



Research Management Centre  
UNIVERSITI PUTRA MALAYSIA