

# TONGWEI AQUANEWS

(Issue 3, August 2008)

## Sichuan Aquacultural Engineering and Technology Research Center

Producer's Prices of Major Agricultural Products Kept Rising in the First Half Year

Eating Fish May Thwart 'Silent' Brain Damage

Aquatic Genetic Resources Reserves

19 Aquaculture Enterprises in Fujian Province Listed as GAP Demonstration Projects

New Nano Tube Oxygenation Technology for Aquaculture

Access System of Aquatic Products Market Implemented in Chengdu

National Standard for Aquatic Feed Taking Shape

Abstracts of research articles published in Chinese Journals

### **Producer's Prices of Major Agricultural Products Kept Rising in the First Half Year**

According to the result of nationwide survey on 31,000 agricultural holdings conducted by National Bureau of Statistics of China, it showed that in the first half year, the producer's price of major agricultural products (the direct price which sold by the agricultural producers) grew up 22.9%, year-on-year. Of which, the producer's price of planting, forestry, animal husbandry and fishing products rose 13.8, 12.1, 39.8 and 12.8%, respectively.

In terms of animal husbandry products, the producer's price of pigs slaughtered, meat cattle and beefs, live sheep, poultry, eggs, and dairy products jumping 54.9, 34.4, 32.6, 16.4, 14.4 and 34.0%, respectively, while that of feather products decreased 8.6%.

In terms of fishing products, the producer's price of seawater products climbed up by 6.2% year-on-year. Of which, seawater fish and seashell up 8.4 and 2.3%, respectively; the producer's price of freshwater fisheries products was up by 17.8%, of which, freshwater fish and freshwater shrimp and crab climbing 17.4 and 23.4%, respectively.

Source: [www.mofcom.gov.cn](http://www.mofcom.gov.cn), July 23, 2008

### **Eating Fish May Thwart ‘Silent’ Brain Damage**

Older adults who regularly eat fish may have a lower risk of subtle brain damage that contributes to stroke and dementia, as long as the fish isn’t fried, researchers reported on Monday.

In a study that followed 3,660 adults age 65 and older, Finnish researchers found that those who ate more fish were less likely to show certain “silent” brain infarcts, tiny areas of tissue that have died because of an insufficient blood supply, on an MRI scan.

The tissue damage is considered silent, or “subclinical,” because it causes no obvious symptoms and can only be detected through brain scans. It can, however, raise a person’s longer-term risk of having a stroke or developing dementia.

Among older adults in the current study, those who said they ate tuna and “other” baked or broiled fish at least three times per week were one-quarter less likely than those who rarely ate fish to have subclinical brain infarcts at the study’s start.

Fish eaters also tended to be less likely to develop new infarcts over the next five years. No such benefits were linked to consumption of fried fish, however, the researchers report in the journal *Neurology*.

While the study cannot conclusively point to the reason for the brain benefits, it’s likely that omega-3 fatty acids, the healthy fats found mainly in oily fish, play a key role, according to Dr Jyrki K. Virtanen and colleagues at the University of Kuopio.

#### *Breakfast benefits may differ*

A new study suggests adolescents and young adults may be less attentive in school when they skip breakfast. Moreover, the effect of missing this meal is different in boys and girls, the researchers found.

Dr Katharina Widenhorn-Mueller of Ulm University and her colleagues note in the medical journal *Pediatrics* that males reported being in a worse mood when they went without breakfast, and their visuospatial memory was also negatively affected, but the same wasn't true of girls.

While parents and teachers often argue that eating breakfast is essential for school success, one review of more than 50 years of research on the topic found that "evidence in support of breakfast is equivocal," Widenhorn-Mueller and her team note.

To examine the effects of eating breakfast on learning in students' natural environment, the researchers looked at 104 boarding school students aged 13 to 20. Half of them ate a standardized breakfast on the first day of the study and half didn't, after which both groups completed several tests of cognitive function and a questionnaire designed to gauge their mood. A week later, the breakfast group fasted and underwent the tests, and vice versa.

Eating breakfast had no effect on students' ability to sustain attention, but all of the students reported feeling more alert after eating breakfast. Boys said their mood was better after they ate breakfast, while they also scored better on tests of visuospatial memory.

There are several ways that eating breakfast might be helpful, the researchers note; it could give people the energy and nutrients they need to produce brain signaling chemicals known as neurotransmitters, while the protein, carbohydrate and fat composition of the meal might also effect mood.

*Source: China Daily/Agencies, August 6, 2008*

### **Aquatic Genetic Resources Reserves**

On 9 July 2008, Sichuan Provincial Government approved to establish 9 Aquatic Genetic Resources Reserves. These reserves include Chinese soft-shelled turtle (*Trionyx sinensis*) in Bazhong City, rock carp (*Procypris rabaudi*) in Tongjiang County, David's schizothoracin (*Schizothorax (Racoma) davidi*) in Nanjiang County, yellow catfish (*Pelteobagrus Bleeker*) in Dayin

County, Mandarin fish (*Siniperca chuatsi*) in Yanting County, yellow catfish (*Pelteobagrus Bleeker*) and *Onychostoma angustistomata* in Guang'an City, rock carp (*Procypris rabaudi*) and *Spinibarbus sinensis* in Wusheng County, *Percocypris pingi* and *Schizothorax dolichonema* in Mian'ning County, and *Gymnodiptychus pachycheilus* in Luhuo County.

On 22 August 2008, the Yangtze Fisheries Resources Management Committee invited experts and the representatives of fisheries administration and fishery law enforcement organizations from relevant provinces and cities to attend the Hearing on Plan of National Aquatic Genetic Resources Reserves in Shanghai. During the hearing, the Plans of National Aquatic Genetic Resources Reserves for four Chinese carps (grass carp, black carp, silver carp and bighead carp) and Yangtze *Coilia ectenes* prepared by Yangtze Fisheries Institute and Freshwater Research Center have been passed by experts after argumentation.

The participants for the hearing have agreed that the establishment of aquatic genetic resources reserves in the Yangtze River watershed area is an important step for implementing China Aquatic Biological Resources Conservation Action Plan. They agreed that as the important economical fish species in the Yangtze River watershed area the natural genetic resources of the four Chinese carps had decreased sharply in recent years, and it was necessary to set up national genetic resources reserves for those species. The Yangtze Fisheries Resources Management Committee will revise the plans according to the comments from the participants and submit to the National Fisheries Bureau of the Ministry of Agriculture for approval.

*Source: China Fishery News, August 13, 2008; <http://www.nftec.com>, August 29, 2008*

### **19 Aquaculture Enterprises in Fujian Province Listed as GAP Demonstration Projects**

Recently, National Certification and Accreditation Administration and National Standardization Management Committee jointly announced the list of GAP Demonstration Projects, on which there are 19 aquaculture enterprises in Fujian Province, including as big yellow croaker, eel, tilapia, seabream and channel catfish.

It was reported that in April of 2003, the National Certification and Accreditation Administration took the initiative to establish GAP system for the upper stream of food chain, and an expert group for GAP Certification System was formed to draft relevant criteria, regulations and standards in early 2004. In January 2006, the National Certification and Accreditation Administration announced the GAP and relevant national standards. In August 2007, it published Implementation Rule for GAP for Agriculture, which covers nearly 20 aquaculture species.

*Source: www.fjof.gov.cn, August 28, 2008*

### **New Nano-Tube Oxygenation Technology for Aquaculture**

Recently, a new nano-tube technology was utilized in oxygenation for aquaculture has been used in Hangu District of Tianjin City. The cost of the nano technology is about US\$ 1,980 per hectare, which increases production by 10% - 15% but reduce production cost by 5% - 10% compared to the conventional aquaculture, increasing net return of US\$3,300 per hectare.

The principle of the nano-tube technology for oxygenation is by using PVC tube for ventilation, which connects to polymeric microporous nano oxygenation tube. Through pipes placed at pond bottom, a V-shape air bubbles flow from pond bottom towards water surface to supply oxygen from pond bottom throughout water column and maintain high level of dissolved oxygen at pond bottom. The new nano-tube technology can purify pond water through physical reactions and improve shrimp immunological capacity.

*Source: Daily Update August 21,2008*

### **Market Access System of Aquatic Products Implemented in Chengdu**

To guarantee the quality and safety of aquatic products, safeguard the consumers' health, and promote the sustainable and healthy development of aquaculture sector, Chengdu Municipal

Government of Sichuan Province has announced the Implementation on Market Access System of Aquatic Products. Starting from 01 September 2008, all aquatic products to be produced, sold and distributed in the city must have quality certificate and inspection and quarantine certificate of agricultural products. The legal representatives and responsible persons of the enterprises which produce and sell fake and poor quality aquatic products will not be allowed to engage in the production and sales of aquatic products and to register new enterprises or be employed as legal representatives of other enterprises within a period of 3 years.

*Source: Sichuan Provincial Fishery Bureau, April 26, 2008*

### **National Standards for Aquafeed to be established**

Standardization Administration of the Peoples Republic of China approved to establish Subcommittee on Aquafeed of National Technical Committee on Feed Industry of Standardization Administration of China on 12 June 2008. The secretariat of the subcommittee is set up in Evergreen Group. The subcommittee is mainly responsible to develop and revise the standards for aquafeed, assessing and monitoring environmental impacts of aquafeed, health and sanitation of aquafeed and analysis methods.

*Source: <http://www.sac.gov.cn>, July 10, 2008*

**Abstracts of research articles published in Chinese Journals**

**Distribution Patterns of Digestive Enzyme Activities in Grass Carp (*Ctenopharyngodon idellus*)  
and Black Carp (*Mylopharyngodon piceus*)**

LIU Zhong-yi, WANG Zhang

*Institute of Food Science, Southern Yangtze University, Wuxi, Jiangsu 214036*

Grass carp (a herbivorous fish) and black carp (a carnivorous fish) were selected to investigate distribution patterns of their digestive enzymes including pepsin-like enzymes, trypsin-like enzymes, amylase and lipase along the intestine, liver and pancreas. The present investigations showed that these enzymes displayed different distribution patterns in digestive tract; the activities of the enzymes in liver and pancreas were higher than those in digestive tract, different digest tissue of the two species are different; the distribution patterns of the main digest enzymes in different digestive organs of the two organs were quite different.

Key words: grass carp; black carp; digest enzyme; protease; amylase; lipase

Source: Freshwater Fisheries, Jan. 2006, Vol. 36 (1): 14-18

**Primary Study on Properties of Amylase from Nile Tilapia (*Oreochromis niloticus*)**

XIE Jin-jin, JIANG Na-hong, HONG Lv-ping, CAI Bing-yan

*Biology Department, Institute of Biochemistry and Molecule Biology, Quanzhou Normal University, Fujian 362000*

Properties of amylase from Nile tilapia (*Oreochromis niloticus*) was studied in the paper. The result showed that: the optimum pH for amylase was 6.5, the optimum substrate concentration was 2%. The effects of some metal ions on the amylase activity were studied. And the positive univalent metal ions was  $K^+$ ,  $Li^+$  and  $Na^+$  had little influence on the enzyme activity. The positive

bivalent metal ions inhibit the enzyme and the order of the inhibit intensity was as follows:  $\text{Cu}^{2+} > \text{Zn}^{2+}$ . And positive bivalent alkaline earth metal ions ( $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$  and  $\text{Ba}^{2+}$ ) affected the enzyme and the order of the activation intensity was as follows:  $\text{Mg}^{2+} > \text{Ca}^{2+}$ , but  $\text{Ba}^{2+}$  inhibit the enzyme activity. The positive trivalent metal ions  $\text{Al}^{3+}$  had the inhibitory activity, but the effect was unobvious, and  $\text{Fe}^{3+}$  had the activation effect. And heavy metal ions  $\text{Cd}^{2+}$ ,  $\text{Pb}^{2+}$  inhibited the enzyme strongly.

Key words: Nile Tilapia (*Oreochromis niloticus*); amylase activity; metal ions

Source: Freshwater Fisheries, Mar. 2007, Vol. 37 (2): 34-37

### **Advances on the Studies of the Effect of Ecological Factors on Activities of Digestive Enzymes of Fish**

TIAN Hong-jie<sup>1,2</sup>, ZHUANG Ping<sup>1,2</sup>, GAO Lu-jiao<sup>2</sup>

1. *E-Institute of Shanghai Municipal Education Commission, College of Life Science and Technology, Shanghai Fisheries University, Shanghai 200090, China;*

2. *East China Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, Key and Open Laboratory of Marine and Estuarine Fisheries of Agriculture, Shanghai 200090, China*

The activities of digestive enzymes of fish are closely connected with their environment. In this paper, the relationship between digestive enzymes of fish and ecological factors such as water temperature, salinity, pH, heavy metal ion and diet (nutrition level, exogenous enzymes and their amount) were discussed, which could provide a basic information for manufacture of artificial fish diet and for better fish growth.

Key words: Fish; digestive enzyme; water temperature; salinity; pH, heavy metal ion; diet

Source: Marine Fisheries, May, 2006, Vol.28 (2): 158-162



**Effects of Compound Enzyme Preparation Supplemented in Diet on Indexes of the Growth Performance and Apparent Digestibility of Feeds in *Allogynogenetic crucian* carp**

ZHANG Li, HUANG Feng, LIU Jun, ZHOU Yanping

*Feed Science Dept., Wuhan Polytechnic University*

Three-hundred and sixty *Allogynogenetic crucian* carp were chosen to determine the effects of compound enzyme preparation supplemented in diet on indexes of the growth performance and apparent digestibility of feeds in *Allogynogenetic crucian* carp (average initial weight 6.71 g) for 56 days. The results showed: the weight gain rate, specific growth rate and the apparent digestibility of crude protein, phosphonium and energy with 200 mg/kg compound enzyme preparation group were highest among all groups, and significantly higher than those of the control group ( $P < 0.05$ ); and its feed conversion ratio was lowest in all groups, and significantly lower than that of the control group ( $P < 0.05$ ). These results suggested that: supplementation of 200 mg/kg of the compound enzyme preparation in the *Allogynogenetic crucian* carp diet could significantly improve the apparent digestibility of feed, enhance growth performance and decrease the feed conversion ratio.

**Key Words:** *allogynogenetic crucian* carp; compound enzyme preparation; growth performance; apparent digestibility

Source: China Feed, Issue 23, 2007:36-39

**Nitrite Uptake Mechanism and the Influencing Factors of Accumulation in Aquatic Animals**

GAO Minghui, MA Libao, GE Lian, MEI Chunsheng, XU Haitao, CHEN Wei

*Department of Animal Nutrition and Feed Science, College of Animal Science and Technology,  
Huazhong Agriculture University, Wuhan 430070, China*

Nitrite is a potential pollutant in aquatic culture systems. Freshwater fishes actively take part nitrite across the gills, leading to high concentrations accumulated within body. Marine fishes are less susceptible but do take up nitrite intestine and gills. Many factors can influence nitrite accumulation. This paper gave a discussion about nitrite uptake mechanism and the influencing factors of accumulation in aquatic animals.

Key words: nitrite; uptake mechanism; toxicity; accumulation

Source: South China Fisheries Science, Vol. 4 (4), Aug. 2008: 73-79

### **Analysis of Factors of Water Treatment with Biofilm Sequence Batch Reactor in Recirculating Aquaculture Systems**

LIU Huang<sup>1,2</sup>, GUAN Chongwu<sup>2</sup>, NI Qi<sup>1</sup>, SONG Hongqiao<sup>2</sup>, HU Bocheng<sup>1</sup>

*1. Fishery Machinery and Instrument Research Institute, Chinese Academy of Fishery Sciences,  
Shanghai 200092, China;*

*2. Key Lab. of Fishery Water Treatment, Chinese Academy of Fishery Sciences, Shanghai 200092,  
China*

BSBR (biofilm sequence batch reactor) is a treatment technology. It takes advantages of both activated sludge process and SBR. The paper was to analyze factors of BSBR treatment in recirculating aquaculture systems in terms of removal speed of TAN and TN. The pH and alkalinity has big influence on the nitrification reaction, with better removal of TAN and TN under pH > 6.3. Dissolved oxygen has also big influence on denitrification reaction. Considering the growth demand of aquatic organism, it is better to control the influent water dissolved oxygen to be 4.5-6.5 mg L<sup>-1</sup> in the experimental installation. The water temperature is better maintained at about 20 so that a good denitrogenation effect can be guaranteed.

Key words: biofilm sequencing batch reactor (BSBR); recirculating aquaculture systems (RAS)

Source: South China Fisheries Science, Vol.4 (4), Aug. 2008: 55-59

### **The Evolution and Application of Automatic Feeding System in Aquaculture**

ZHUANG Baolu<sup>1,2</sup>, GUO Genxi<sup>1</sup>

*1.South China Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, Guangzhou  
510300, China;*

*2.Shanghai Ocean University, Shanghai 200090, China*

The evolution of aquaculture automatic feeding system was briefly reviewed. Research progress on automatic feeding system and its application in offshore cage culture in foreign countries was emphasized in this paper. The status of automatic feeding system and its application in China was addressed as well, and some suggestions were given for the development of the national automatic feeding systems.

Key words: automatic feeding; offshore cage; industrialized aquaculture; aquaculture apparatus

Source: South China Fisheries Science, Vol.4 (4), Aug. 2008:67-72

### **Nozzle Design of High-pressure Free-jet-type Submarine Net Cleaning Machine**

HU Yu, GUO Genxi, HUANG Xiaohua, TAO Qiyu

*South China Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, Guangzhou  
510300, China*

In order to solve the problem of fouling organisms blocking water exchange for deep-water cage and thus caused great difficulty in net changing and cleaning, developing submarine net cleaning machine and improving its cleaning efficiency were the important supporting facilities and technology for deep-water cage culture. Through analysis of operation principle of high-pressure

submarine net cleaning machine, the structure geometric parameters calculation expression of nozzle were deduced based on energy equation. Optimal pressure and flow in high pressure water generating system were selected, and aperture/slenderness ratio of nozzle was calculated. Hydraulic parameters were calculated. These parameters supplied theoretical support for optimizing the structure of net washing machine.

Key words: submarine net cleaning machine; water free jet; nozzle; deep-water cage

Source: South China Fisheries Science, Vol.4 (4), Aug. 2008:16-20

### **Seasonal Variation Analysis of Fouling Organisms on Offshore Cages in Zhoushan**

SHUI Bonian<sup>1</sup>, GUO Difei<sup>2</sup>

1. Fisheries School of Zhejiang Ocean University, Zhoushan 316004, China;

2. Putuo District Ocean and Fisheries Bureau, Zhoushan 316100, China

From July 2006 to May 2007, seasonal changes of fouling organisms on the cages were examined in the sea areas beside Xiushan Island and Changzhi Island through randomly sampling, identifying and measuring of the samples. The aims were to discover the monthly variation of fouling species, their biomass and density in two sea areas. The results showed that the fouling organisms were composed of *Hydra vulgaris*, *Actina* sp., *Caprella kroyeri*, *Gammarus* sp. *Balanus* sp., *Mytilus edulis*, *Ostrea* sp., *Ulva pertusa*, and *Enteromorpha* sp. Their standing crop biomass and attaching density were recorded as well. The monthly variation was characterized that organisms occurred heavily from July to November. After November, the amount of fouling organisms, such as *Ulva pertusa*, *Anthopleura pacifica*, reduced greatly with the temperature decreasing. From March of next year, the amount of fouling organisms, such as *Caprella kroyeri*, *Anthopleura pacifica*, *Ampithoe valita*, started to increase gradually with the temperature rising.

Key words: cage; fouling organism; species; seasonal variations

Source: South China Fisheries Science, Vol.4 (4), Aug. 2008:36-41

### **Studies on Fishery Resources in the Three Gorges Reservoir of the Yangtze River**

WU Qiang<sup>1,2</sup>, DUAN Xin-Bin<sup>2,3</sup>, XU Shu-Ying<sup>1,2</sup>, XIONG Chuan-Xi<sup>1</sup>, CHEN Da-Qing<sup>2,3</sup>

1. Fisheries College, Huazhong Agricultural University, Wuhan 430070;

2. Key Laboratory of Freshwater Fish Germplasm Resources & Biotechnology, Ministry of Agriculture, Yangtze River Fisheries Research Institute, Chinese Academy of Fishery Sciences, Jingzhou, Hubei 434000;

3. Freshwater Fisheries Research Center, Chinese Academy of Fishery Sciences, Wuxi, Jiangsu 214081

From 2005 to 2006, the fishery status of the Three Gorges reservoir was surveyed for 3 times. For each survey, 17 stations were set, and every survey lasted for 1 to 2 months. At the same time, point monitoring in Banan and Wanzhou section of Yangtze River was taken twice each month. The survey found 110 fishes which can be classified for 9 orders 15 families 67 genus. *Hypophthalmichthys molitrix* (Cuvier et Valenciennes), *Silurus solldatovi* (Nikolsky et soin), *Cyprinus carpio* (Linnaeus), *Pelteobagrus fulvidraco* (Richardson), *Coreius heterodon* (Bleeker), *Coreius guichenoti* (Savauge et Dabry), *Rhinogobio ventralis* (Sauvage et Dabry), *Rhinogobio cylindricus* (Gunther), *Leicassis longirostris* (Gunther), *Ctenopharyngodon idella* (Cuvier et Valenciennes) and *Hemiculter* were the main species in the Three Gorges reservoir. The catches in different sections of the river were different, and miniaturization and trend of the lower age was quiet district. In catches, the number of low-aged and small individual had been getting more.

Key words: the Three Gorges reservoir, survey, fishery resources

Source: Freshwater Fisheries, Vol. 37 (2), Mar. 2007: 70-75

## **Nanomaterial Application in Carp Aquaculture Experiment**

LIU An-xun, CAO Yu-jiang, DAI Ming, LIAO Zong-wen

New Fertilizer Resources Research Center, South China Agriculture University, Guangzhou  
510642, China

In order to research the effects of nanomaterials on carp growth and physio-chemical properties of the water, an experiment of carp aquaculture was conducted in lab condition on the effect of nanomaterial on small carp and physio-chemical properties. The result indicated that all the nanomaterial treatments could increase fish-survival rate. Nanonet treatment was the best among all treatments, showing survival rate with 100% increase, while water nitrite and nitrate decrease, nitrate decrease as low as 1/4 of control group. Nanomaterial increased water pH. The water quality was improved obviously. Nanotechnology has showed a broad prospect in aquaculture.

Key words: nanomaterial; nitrite, nitrate; aquaculture

Source: Fishery Modernization, Vol.35 (2), 2008: 24-27