

เอกสารอ้างอิง

- กิจการ ศุภมาตย์ และวัชรินทร์ รัตนชู. 2530. ผลการเปลี่ยนแปลงความเค็มของน้ำต่อองค์ประกอบเลือดในปลานิล (*Sarotherodon niloticus*). ว.สงขลานครินทร์ วทท. 9: 471-477.
- เครือวัลย์ สติธิรัต. 2542. ตลาดสัตว์น้ำตระกูลปลานิลในบริเวณซีกโลกตะวันตก. จุลสารเศรษฐกิจการประมง 5: 18-22.
- นวลมณี พงศ์ธนา และพุทธรัตน์ เป้าประเสริฐกุล. 2538. การทดลองเพาะเลี้ยงปลานิลเพศผู้ GMT. ว.ประมง 3: 255-260.
- นิรุทธิ์ สุขเกษม. 2544. ผลของระดับกากเนื้อเมล็ดในปาล์มน้ำมันต่อการเจริญเติบโตของปลานิล (*Oreochromis niloticus* Linn.).วิทยานิพนธ์วิทยาศาสตรมหาบัณฑิต มหาวิทยาลัยสงขลานครินทร์.
- บุญล้อม ชีวะอิสระกุล และ สุชน ตั้งทวีพัฒน์. 2540. ไฟเตทสารขัดขวางการใช้ประโยชน์ของฟอสฟอรัสในสัตว์. ว.มหาวิทยาลัยเชียงใหม่ 7: 23-30.
- พูนสิน พานิชสุข, ยงยุทธ ปริดาลัมพะบุตร, คุณิต ดันวิไล และพุทธ ส่องแสงจินดา. 2530. การสำรวจการเปลี่ยนแปลงคุณภาพน้ำเพื่อการเพาะเลี้ยงสัตว์น้ำชายฝั่งในจังหวัดสงขลา. เอกสารวิชาการฉบับที่ 7/2530 สถาบันเพาะเลี้ยงสัตว์น้ำชายฝั่ง จังหวัดสงขลา กรมประมง
- ภาณุ เทวรัตน์มณีกุล, สุจินต์ หนูขวัญ, กำชัย ลาวัณยุทธิ, วีระ วัชรกรโยธิน และนวลมณี พงศ์ธนา. 2539. หลักการเพาะเลี้ยงปลา. เอกสารเผยแพร่ฉบับที่ 30 สถาบันวิจัยการเพาะเลี้ยงสัตว์น้ำจืด กรมประมง, กระทรวงเกษตรและสหกรณ์.
- มะลิ บุญยรัตผลิน และจู่อะดี พงศ์มณีรัตน์. 2533. ความต้องการฟอสฟอรัสในอาหารปลากะพงขาว. เอกสารวิชาการ. สถาบันวิจัยการเพาะเลี้ยงสัตว์น้ำชายฝั่ง, สงขลา. 20 น.
- มานพ ตั้งตรงไพโรจน์, ภาณุ เทวรัตน์มณีกุล, พรรณศรี จริโมภาส, สุจินต์ หนูขวัญ, กำชัย ลาวัณยุทธิ, วีระ วัชรกรโยธิน และวิมล จันทรโรทัย. 2536. การพัฒนาการเพาะเลี้ยงปลานิล. เอกสารเผยแพร่ฉบับที่ 23 สถาบันวิจัยการเพาะเลี้ยงสัตว์น้ำจืด กรมประมง, กระทรวงเกษตรและสหกรณ์.

- ยุพินท์ วิวัฒน์ชัยเศรษฐ์. 2543. สัมมนาการเพาะเลี้ยงสัตว์น้ำเศรษฐกิจเพื่อการส่งออก เรื่องการเลี้ยงการเลี้ยงปลานิลในกระชังสัตว์น้ำเศรษฐกิจปี 2000. ว.ประมง 53: 81-92.
- วุฒิพร พรหมขุนทอง, วิมล จันทรโรทัย, นรินทร์ สงสีจันทร์ และนพพร มานะจิตต์. 2540. ระดับโปรตีนในอาหารที่เหมาะสมต่อปลากดเหลืองขนาดปลาน้ำ. ว.สงขลา นครินทร์ วทท. 19: 327-335.
- อุทัยรัตน์ ณ นคร. 2529. การเพาะขยายพันธุ์ปลา. ภาควิชาเพาะเลี้ยงสัตว์น้ำ คณะประมง มหาวิทยาลัยเกษตรศาสตร์.
- Al-Hafedh, Y.S. and Siddiqui, A.Q. 1998. Evaluation of guar seed as a protein sources in Nile tilapia, *Oreochromis niloticus* (L.) practical diets . Aquacult. Res. 29: 703-708.
- Al-Ogaily, S.M., Al-Asgah, N.A. and Ali, A. 1996. Effect of feeding different grain sources on the performance and body composition of tilapia, *Oreochromis niloticus* (L.). Aquacult. Res. 27: 523-529.
- Anderson, T.A. and De Silva, S.S., 1996 . Scope for low pollution aquafeeds and feeding strategies in Asia, pp. 45- 56. In Vietnam Asia Conference 1996 . Feed Production on the threshold of the Next- Age. Bangkok, Thailand.
- Andrews, J.W., Muri, T. and Campbell, C. 1973. Effects of dietary calcium and phosphorus on growth, food conversion, bone ash and hematocrit levels of catfish. *Ictalurus punctatus*. J. Nutr. 103: 766-771.
- Anwar, M.F. and Jafri, A.K. 1995. Effect of varying dietary lipid levels on growth, feed conversion, nutrient retention and carcass composition of fingerling catfish, *Heteropneustes fossilis*. Asian Fish. Sci. 8: 55-62.
- AOAC. (Association of Official Analytical Chemists). 1990. Official Methods of Analysis. Washington, DC: AOAC.
- Bancroft, J.D. 1967. Histochemical Techniques. London: Butterworths.
- Ballestrazzi, R., Lanari, D. Agaro, E. and Mion, A. 1994. The effect of dietary protein level and source on growth, body composition, total ammonia and reactive phosphorus excretion of growing sea bass *Dicentrarchus labrax*. Aquaculture. 127: 197-206.

- Belal, I.E.H. 1999. Replacing dietary corn with barley seeds in Nile tilapia, *Oreochromis niloticus* (L.) feed. Aquacult. Res. 30: 265-269.
- Belal, I.E.H. and Al-Jasser, M.S. 1997. Replacing dietary starch with pitted date fruit in Nile tilapia, *Oreochromis niloticus* (L.) feed. Aquacult. Res. 28: 385-389.
- Bhujel, R. C. 2000. A review of strategies for the management of Nile tilapia *Oreochromis niloticus* broodfish in seed production systems, especially hapa-based system. Aquaculture. 184: 37-59.
- Blaxhall, P.C. and Daisley, K.W. 1973. Routine hematological methods for use with fish blood. J. Fish Biol. 5: 771-781.
- Boonyaratpalin, M. and Phromkunthong, W. 2000. Effects of Ronozyme treated rice bran and oil palm meal on growth of sex reversed *Tilapia niloticus*. The Sixth Roche Aquaculture Conference Asia Pacific (ed. B. Hunter) Bangkok, Thailand, September 29 2000, pp. 50-63.
- Bowen, S.H., 1982. Feeding digestion and growth qualitative considerations. In. Pullin, R.S.V., Lowe, Mc., Connell, R.H.(eds.). The Biology and Culture of Tilapias . ICLARM Conference Proceedings 7, International Center for Living Aquatic Resources Management, Manila, Philippines ICLARM. pp. 141-156.
- Boyd, C.E. and Tucker, C. S. 1992. Water Quality and Pond Soil Analyses for Aquaculture. Alabama: Auburn University.
- Brown, M.L., Jaramillo, F. and Gatlin III. 1993. Dietary phosphorus requirement of juvenile sunshine bass, *Morone chrysops* x *M. saxatilis*. Aquaculture. 113: 335-363.
- Cain, K. D. and Garling, D. L. 1995. Pretreatment of soybean meal with phytase for salmonid diets to reduce phosphorus concentrations in hatchery effluents. Prog.Fish-Cult. 57:114-119.
- Clain, W.R. and Gatlin, D.M. 1988. Dietary zinc requirement of *Oreochromis niloticus* and effects of dietary calcium and phytate on zinc bioavailability. J. World Aqua. Soc. 19: 103-108.

- Cosgrove, D.J. 1980. Inositol Phosphates. Their chemistry, biochemistry and physiology. Elsevier Science Publishers, Amsterdam, 175.
- Crowell, G.L., Stahly, T. S., Coffey, R. D., Monegue, H. J. and Randolph. J. H. 1993. Efficacy of phytase in improving the bioavailability of phosphorus in soybean meal and corn-soybeanmeal diets for pigs. *J. Anim. Sci.* 71: 1831-1840.
- Dabrowska, H., Burgdorff, M. and Gunther, K. D. 1989. Interaction between dietary protein and magnesium level in tilapia *Oreochromis niloticus*. *Aquaculture* 76: 277-291.
- Davis, D.A. and Gatlin III, D.M. 1991. Dietary mineral requirements of fish and shrimp, pp. 49-67. *In*. D.M. Akiyama and Tan, R.K.H. (eds.). Proceedings of the Aquaculture Feed Processing and Nutrition Workshop. American Soybean Association, Singapore.
- Davis, D.A. and Gatlin III, D.M. 1996. Dietary mineral requirements of fish and marine crustaceans. *Rev. Fish. Sci.* 4: 75-99.
- Dato-Cajegas, C.R. S. and Yakupityage, A. 1996. The need for dietary mineral supplementation for Nile tilapia, *Oreochromis niloticus* cultured in a semi-intensive system. *Aquaculture* 144: 227-237.
- De Silva, S.S., Gunasekera, R.M. and Smith, K.F. 1991. Interaction of varying dietary protein and lipid levels in young red tilapia: evidence of protein sparing. *Aquaculture* 95: 305-318.
- De Silva, S.S. and Anderson, T.A. 1995. Fish nutrition in aquaculture. London : Chapman & Hall.
- Dey, P. M. and Harborne, J. B. 1990. Methods in Plant Biochemistry. Vol 2. Carbohydrates. Academic Press. London. 657.
- Dougall, D.S., Woods, L.C., Douglass, L.W. and Soares, J.H. 1996. Dietary phosphorus requirement of juvenile striped bass *Morone saxatilis*. *J. World Aqua. Soc.* 27: 182-91.
- Duncan, D.B. 1955. Multiple-range and multiple F tests. *Biometrics* 11: 1-42.

- Dupree, H.K. and Sneed, K.P. 1966. Response of channel catfish fingerling to different levels of major nutrients in purified diets. U.S. Bureau of Sports Fish and Wildlife Tech. Pap. No.9.
- El-Sayed, A.F.M. 1998. Total replacement of fish meal with animal protein sources in Nile tilapia, *Oreochromis niloticus* (L.) feed. Aquacult. Res. 29: 275-280.
- El-Zibdeh, M., Ide, K. Yoshimatsu, T. Matsui, S. and Furuichi, M. 1995. Requirement of yellow croaker *Nibea albiflora* for dietary phosphorus. J. Fac. Agric. Kyushu Univ. 40: 147-155.
- Ensminger, A.H., Ensminger, M.R. Knolande, J.E. and Robson, J.R.K. 1994. Food Nutrition Encyclopedia VII. CRC Press, London.
- Eya, J.C. and Lovell, R.T. 1997. Net absorption of dietary phosphorus from various inorganic sources and effect of fungal phytase on net absorption of plant phosphorus by channel catfish *Ictalurus punctatus*. J. World. Aqua. Soc. 28: 386-391.
- Fagbenro, O.A. 1994. Dried fermented fish silage in diets for *Oreochromis niloticus*. Isr. J. Aquacult. -Bamidgah 46: 140-147.
- Food Protection Committee. 1996. Food chemicals codex. Prepared by the Committee on Specifications, National Academy of Sciences National Research Council. Publication 1406. Washington, D.C., USA.
- Forster, I., Higgs, D.A., Dosanjh, B.S., Rowshandeli, M. and Parr, J. 1999. Potential for dietary phytase to improve the nutritive value of canola protein concentrate and decrease phosphorus output in rainbow trout *Oncorhynchus mykiss* held in 11 °C fresh water. Aquaculture 179: 109-125.
- Furukawa, A. and Tsukahara, H. 1966. On the acid digestion method for the determination of chromic oxides as an index substance in the study of digestibility of fish feed. Bull. Jap. Soc. Sci. Fish. 32: 502-506.
- Gatlin, D.M. and Phillis, H.F., 1989. Dietary calcium, phytate and zinc interactions in channel catfish. Aquaculture 79: 259-266.

- Gibbins, L.N. and Norris, F.W., 1963a. Phytase and acid phosphorus in the dwarf bean (*Phaseolus vulgaris*). *Biochem J.* 86: 67-71.
- Gibbins, L.N. and Norris, F.W., 1963b. Vitamins in germination dwarf bean (*Phaseolus vulgaris*). *Biochem J.* 86: 64-67
- Gibson, D.M. and Ullah, A.B.J., 1990. Phytase and their actions on phytic acid. *In* Morre, D.J., Boss, W.F., Loewus, F.A. (Eds.), *Inositol Metabolism in Plants*. Wiley-Liss, New York, pp.77-92.
- Gifford, S.R. and Clydesdale, F.M. 1990. Interactions among calcium, zinc and phytase with protein sources. *J. Food Sci.* 55: 1720-1724.
- Gur, N. 1998. Enzymatic supplements in aquafeeds. *Fish Fishbreed-Isr.* 31: 78-86.
- Halver, J. E. 1989. *Fish Nutrition* 2nd edn, New York: Academic Press.
- Haug, W. and Lantzsch, H.J. 1983. Sensitive methods for the determination of phytate in cereals and cereal products. *J. Food. Agr.* 34: 1423-1426.
- Haylor, G.S., Beveridge, M.C. M. and Jauncey, K. 1988. Phosphorus nutrition of juvenile *Oreochromis niloticus* (L.). *The Second International Symposium on Tilapia in Aquaculture*. (eds. R.S.V. Pullin, T. Bhukaswan, K. Tonguthai and J.L. Maclean). Bangkok, Thailand, 16-20 March 1987, pp. 341-345.
- Hendricks, J.D. and Bailey, G.S. 1989. Adventitious toxins pp. 650-651. *In* Halver, J. E. *Fish Nutrition* 2nd edn, New York: Academic Press.
- Humason, G.L. 1972. *Animal Tissue Technique*, 4th ed. San Francisco, CA: W.H. Freeman and Company.
- Jackson, L.S., Li, M.H. and Robinson, E.H. 1996. Use of microbial phytase in channel catfish. *Ictalurus punctatus*. *J. World. Aqua. Soc.* 27: 309-313.
- Jobling, M. 1994. *Fish Bioenergetics*. New York. Chapman & Hall.
- Jongbloed, A.W., Kemme, P.A. and Mroz, Z. 1993. The role of microbial phytase in pig production, *In* Wenk. C. and Boeessinger, M. (Editors), pp.173-180. *Proceeding of the 1st Symposium. Enzymes in Animal Nutrition*. Switzerland.
- Ketola, H.G. 1985. Mineral nutrition: effects of phosphorus in trout and salmon feeds on

- water pollution. p. 465-473. *In*. Cowey, C.B., Mackie, A.M. and Bell, J.G, (eds.).
Nutrition and Feeding in Fish. Academic Press. New York.
- Kim, J.D., Kim. K.S., Song, J.S., Lee, J.Y. and Jeong, K.S. 1998. Optimum level of dietary monocalcium phosphorus based on growth and phosphorus excretion of minor carp (*Cyprinus carpio*) *Aquaculture* 161: 334-337.
- Kornegay, E.T. 2001. Digestion of phosphorus and other nutrients the role of phytase and factors influencing their activity. p.237-271. *In*. Bedford, M. R. and Partridge, G.G. (eds.). *Enzymes in Animal Nutrition*. CABI Publishing. New York.. USA.
- Kornegay, E.T., Denbow, DM., Yi, Z. and Ravindran, V. 1996. Response of broilers of broilers to graded level of microbial phytase added to maize soybean meal based diets containing three levels of non phytate phosphorus. *Br. J. Nutr.* 75: 839-852.
- Kruger, J.E. Lineback, D. Stauffer, C.E. 1987. *Enzyme and Their Role in Cereal Technology*. AACC, Inc. New York. USA.
- Lanari, D., Agaro, E.D. and Turri, C. 1998. Use of nonlinear regression to evaluate the effects of phytase enzyme treatment of plant protein diets for rainbow trout *Oncorhynchus mykiss*. *Aquaculture* 161: 345-356.
- Larsen, H.M. and Snieszko, S.F. 1961. Modification of the microhematocrit technique with trout blood. *Trans. Am. Fish. Soc.* 90: 139-142.
- Li, M.N. and Robinson, E.H. 1997. Microbial phytase can replace inorganic phosphorus supplements in channel catfish *Ictalurus punctatus*. *J. World. Aqua. Soc.* 28: 402-406.
- Liebert, F., Wecke, C. and Schoner, F.J. 1993. Phytase activities in different gut contents of chickens are dependent on level of phosphorus and phytase supplementations *In*. Wenk, C. and Boessinger, M. (eds) *Enzymes in Animal Nutrition. Proceeding of 1st Symposium Kartause Ittingen, Switzerland, October 13-16*, p. 202.
- Lovell, T. 1988. *Nutrition and Feeding of Fish*. New York : Van Nostrand Reinhold.
- Lowry, O.H., Rosebrough, N.J., Farr, A.L. and Randall, R.J. 1951. Protein measurement with the folin phenol reagent. *J. Biol. Chem.* 193: 265-275.

- Moriarty, D.J.W. 1973. The physiology of digestion of bluegreen algae in cichlid fish, *Tilapia nilotica*. J. Zool. Lond. 171: 25-39.
- NRC (National Research Council). 1983. Nutrient Requirement of Warmwater Fishes and Shellfishes. Washington D.C: National Academy Press.
- NRC (National Research Council). 1988. Nutrient Requirement of Swine. Washington D.C: National Academy Press.
- NRC (National Research Council). 1993. Nutrient Requirement of Fish. Washington D.C: National Academy Press.
- NRC (National Research Council). 1994. Nutrient Requirement of Poultry. Washington D.C: National Academy Press.
- Oliva, T.A., Pereira, J.P., Gounvies, A. and Gromes, E. 1998. Utilization of diets supplemented with microbial phytase by seabass (*Dicentrarchus labrax*) juveniles. Aquat. Living- Resour. 11: 255-259.
- Ogino, C., and Takeda, H. 1976. Mineral requirements in fish III: calcium and phosphorus requirements in carp. Bull. Jap. Soc. Sci. Fish. 42: 793-799.
- Ogino, C., Takeuchi, L. Takeda, H. and Watanabe, T. 1979. Availability of dietary phosphorus in carp and rainbow trout. Bull. Jap. Soc. Sci. Fish. 45: 1538-1553.
- Peers, F.G. 1953. The phytase of wheat. Biochem J. 53: 102-110.
- Philippart, J. C.L. and Ruwet, J.C.L., 1982. Ecology and distribution of tilapias. In. Pullin, R.S.V., Lowe, Mc., Connell, R.H.(eds.). The Biology and Culture of Tilapias . ICLARM Conference Proceedings 7, International Center for Living Aquatic Resources Management, Manila, Philippines ICLARM. pp. 15-59.
- Piva, g., Ferrarini, F., Morlacchini, M., Varini, G., Cerioli, C. and Prandini, A. 1993. Use of phytase to reduce phosphorus in Italian heavy pig diets. In Wenk. C. and Boessinger, M. (Editors), pp.222-230. Proceeding of the 1st Symposium. Enzymes in Animal Nutrition, Switzerland.

- Pointillart, A. 1993. Importance of phytates and cereal phytases in the feeding of pigs. *In*. Wenk. C. and Boessinger, M. (Editors), pp.192-198. Proceeding of the 1st Symposium. Enzymes in Animal Nutrition, Switzerland
- Pointillart, A., Fourdin, A. and Fontaine, N. 1987. Importance of cereal phytase activity of phytate phosphorus utilization by growing pigs fed diets containing triticale or corn. *J. Nutr.* 29: 907-912.
- Porn-ngam, N. 1995. A study on dietary inhibitors of zinc utilization in rainbow trout. *Oncorhynchus mykiss*. Ph.D. Thesis, Tokyo Univ. Tokyo.
- Pouomogne, V., Takam, G. and Pouemegene, J.B. 1997. A preliminary evaluation of cacao husks in practical diets for juvenile Nile tilapia (*Oreochromis niloticus*). *Aquaculture* 156: 211-219.
- Ramseyer, L., Garling, D., Hill, G. and Link, J. 1999. Effect of dietary zinc supplementation and phytase pre-treatment of soybean meal or corn gluten meal on growth, zinc status and zinc related metabolism in rainbow trout, *Oncorhynchus mykiss*. *Fish.Physiol. Biochem.* 20: 251-261.
- Reddy, N.R., Sathe, S.K. and Salunkhe, D.K. 1982. Phytase in legumes and cereals. p.1-92. *In*. Advances in Food Research. Academic Press, New York, USA.
- Rich, M. and Brown, P.B. 1996. Availability of phosphorus from feedstuffs fed to rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* 142: 269-282.
- Richardson, N.C., Higgs, D.A., Beams, R.A, McBride, J.R., 1985. Influence of dietary calcium, phosphorus, zinc and sodium phytate in cataract incidence, growth and histopathology in juvenile chinook salmon (*Oncorhynchus tshawytscha*). *J. Nutr.* 115: 553-567.
- Robaina, L. Izquierd. M.S. Moyana, F.J. Socorro. J., Vergara. J.M. Montero, D. 1998. Increase of the dietary n-3/n-6 fatty acid ration and addition of phosphorus improves live histological alterations induced by feeding diets containing soybean meal to gilthead seabream (*Sparus aurata*). *Aquaculture* 161: 281-293.

- Robinson, E.H. and Wilson, R.P. 1985. Nutrition and feeding. *In* Channel Catfish Culture. (ed. C.S. Tucker) Developments in Aquaculture and Fisheries Science, 15, pp. 323-404. Amsterdam: Elsevier.
- Robinson, E.H., Rawles. S.D., Yette, H.B. and Green, L.W. 1984. An estimate of dietary requirements of fingerling *Tilapia aurata* reared in calcium-free water. *Aquaculture* 41: 389-393.
- Robinson, E.H., Labomascus, D. Brown, P.B. and Linton, L. 1987. Dietary calcium and phosphorus requirements of *Oreochromis aurata* reared in calcium-free water. *Aquaculture* 64: 267-276.
- Rodehutsord, M. and Pfeffer, E. 1995. Effects of supplemental microbial phytase on phosphorus digestibility and utilization in rainbow trout (*Oncorhynchus mykiss*). *Wat Sci. Techn.*31: 143-147.
- Sakamoto, S. and Yone, Y. 1973. Effect of Dietary calcium and phosphorus ration upon growth feed efficiency and blood serum Ca and P level in red sea bream. *Bull. Jap. Soc. Sci. Fish.* 39: 343-348.
- Satoh, S., Takeuchi, T. and Watanabe, T. 1987. Changes of mineral composition in whole body of rainbow trout during growth stages. *Bull. Jap. Soc. Sci. Fish.* 53: 273-279.
- Satoh,S., Yamamoto, H., Takeuchi, T and Watanabe, T . 1983. Effects on growth and mineral composition of rainbow trout of deletion of trace elements or magnesium from fish meal diet. *Bull. Jap. Soc. Sci. Fish.* 49: 425-429.
- Schafer, A. Koppe, W.M., Meyer-Burgdorff, K.H. and Gunther, K.D. 1995. Effects of a microbial phytase on the utilization of native phosphorus by carp in a diet based on soybean meal. *Wat. Sci. Techn.* 31: 149-155.
- Schwimmer, S. 1981. *Source Book of Food Enzymology*. The AVI Publishing Company. USA. 967.

- Shiau, S.Y. and Liang, H.S. 1994. Nutrient digestibility and growth of hybrid tilapia, *Oreochromis niloticus* x *O. aureus*, as influenced by agar supplementation at two dietary protein levels. *Aquaculture* 127: 41-48.
- Shieh, T.R. and Ware, J.H. 1968. Survey of microorganisms for the production of extracellular phytase. *Appl. Microbiol.* 16:1348- 1351.
- Simons, P.C. M., Versteegh, H.A.J., Jongbloed, P.A., Kemme, P.A., Slump, P., Bos, K.D., Wolters, W.G.E., Beudeker, R.F. and Verschoor, G.J. 1990. Improvement of phosphorus availability by microbial phytase in broilers and pigs. *Br. J. Nutr.* 64: 525-540.
- Singh, M. and Krikorian, A.D. 1982. Inhibition of trypsin activity in vitro by phytate. *J. Agr. Food Chem* 30: 799 – 800.
- Soares, J.H. Jr. and Hughes, K.P. 1995. Efficacy of phytase on phosphorus utilization. *In*. Proceedings of the 1995 Maryland Nutrition Conference for Feed Manufacturers. March 23-24. pp.76-79.
- Spinelli, J., Houle, C.R., Wekeli, J.C. 1983. The effect of phytase on growth of rainbow trout *Salmo gairdneri* fed purified diets containing varying quantities of calcium and magnesium. *Aquaculture* 30: 71-83.
- Stickney, R.R. 1979. Principles of Warmwater Aquaculture. New York: John Wiley & Sons.
- Storebakken, T., Shearer, K.D., Roem, A.J. 1998. Availability of protein, phosphorus and other elements in fish meal, soy-protein concentrate and phytase treated soy protein concentrate based diets to Atlantic salmon, (*Salmo salar*) *Aquaculture* 161: 368-379.
- Trewavas, E. 1982. Genertic grouping of Tilapia used in aquaculture. *Aquaculture* 27: 79-81.
- Uhlig, H. 1998. Industrial Enzyme and Their Applications. New York. John Wiley & Sons, Inc.

- Vielma, J., Lall, S.P., Koskela, J., Schoner, F.J. and Mattila, P. 1998. Effect of dietary phytase and cholecalciferol on phosphorus bioavailability in rainbow trout, (*Oncorhynchus mykiss*). *Aquaculture* 163: 309-323.
- Vielma, J., Makinen, T., Ekholm, P. and Koskela, J. 2000. Influence of dietary soy and phytase levels on performance and body composition of large rainbow trout (*Oncorhynchus mykiss*) and algal availability of phosphorus load. *Aquaculture* 183: 349-362.
- Viola, S. and Arieli, Y. 1983. Evaluation of different grains as basic ingredients in complete feeds for carp and tilapia in intensive culture. *Isr. J. Aquacult. -Bamidgeh* 35: 38-43.
- Viola, S., Arieli, Y. and Zohar, G. 1988. Animal protein free feeds for hybrid tilapia (*Oreochromis niloticus x O. aureus*) in intensive culture. *Aquaculture* 75: 115-125.
- Viola, S., Angeoni, H. and Lahav, E. 1994. Present limits of protein sparing by amino acid supplementation of practical carp and tilapia feeds. *Isr. J. Aquacult. -Bamidgeh* 46: 2103-211.
- Viola, S., Zohar, G. and Arieli, Y. 1986. Requirements of phosphorus and its availability from different source for intensive pond culture species in Israel, Part II: Carp culture. *Bamidgeh*, 38: 44-54.
- Watanabe, T., Takeuchi, T., Murakami, A. and Ogino, C. 1980a. The availability to *Tilapia nilotica* of phosphorus in white fishmeal. *Bull. Jap. Soc. Sci. Fish.* 46: 897-899.
- Watanabe, T., Takeuchi, T., Murakami, A. Nose, T. and Ogino, C. 1980a. Requirement of chum salmon held in freshwater for dietary phosphorus. *Bull. Jap. Soc. Sci. Fish.* 46: 361-367.
- Wee, K.L. and Shu, S.W. 1989. The nutritive value of boiled full-fat soybean in pelleted feed for Nile tilapia. *Aquaculture* 81: 303-314.
- Weerd, J.H., Khalaf, K.A., Aartsen, F.J. and Tijssen, P.A.T. 1999. Balance trials with African catfish *Clarias gariepinus* fed phytase treated soybean meal based diets. *Aquacult. Nutr.* 5: 135-142.

- Wilson, R.P. 1991. Channel catfish, *Ictalurus punctatus*. pp. 35-53. In. Wilson, R.P. (ed).
Handbook of Nutrient Requirement of Finfish. CRC Press. London.
- Wilson, R.P., Robinson, E.H. Gatlin III, D.M. and Poe, W.E. 1982. Dietary phosphorus requirement of channel catfish. J. Nutr. 112: 1197-1202.
- Yone, Y. and Fujii, M. 1975. Studies on Nutrition of red sea bream-XI: Effect of ω 3 fatty acid supplement in a corn oil diet on growth rate and feed efficiency. Bull. Jpn. Soc. Fish 41: 73-77.
- Zeitoun, I.H., Tack, P.I. , Halver, J.E. and Ullrey, D.E. 1973. Influence of salinity on protein requirements of rainbow trout, *Salmo gairdneri* fingerling. J. Fish. Res. Board Can. 30: 1867-1873.
- Zemel, M.B. and Shelef, L.A. 1982. Phytic acid hydrolysis and soluble zinc and iron in whole wheat bread as affected by calcium containing additives. J. Food Sci. 47: 535-537.