

Name: Bendik Fyhn Terjesen

Present position Senior research scientist
Work address Nofima Marin, NO-6600 Sunndalsøra, Norway
Telephone +47 404 57 874 / +47 916 31 702
E-mail bendik.terjesen@nofima.no

Degrees

(2001) Dr. scient., environmental physiology, University of Bergen
(1995) Cand. scient., environmental physiology, University of Bergen
(1990) College Candidate, Fishery Industry and Aquaculture, at currently Aalesund University College, Norway

Experience

(2007-) Senior research scientist, Nofima Marine, Nutrition Division
(2004-05) Research scientist (10% position), Aquaculture Protein Center CoE, Protein and Amino acid Metabolism Section
(2003-04) Post-doctoral Fellow, School of Environment and Natural Resources, College of Food, Agricultural, and Environmental Sciences, The Ohio State University, USA
(2001-07) Research scientist, AKVAFORSK, Institute of Aquaculture Research, Norway.
(1996-2001) University research fellow, Dept. of Zoology, University of Bergen, Norway
(1996) Research assistant (part-time), Dept. of Zoology, University of Bergen, Norway
(1992-93) Laboratory assistant (part-time), Institute of Marine Research, Bergen, Norway
(1989) Assistant manager (part-time), Nordvestsmolt AS salmon hatchery

Present research activities and fields of interest

General fish physiology related to aquaculture, excretory nitrogen metabolism, amino acid metabolism and nutrition, embryonic and larval physiology, Atlantic cod culture, intensive aquaculture production systems, recirculating aquaculture systems

Memberships in academic and professional committees/networks

Association of Norwegian Physiologists, Norwegian Association of Research Workers, Association of Norwegian Oceanographers, ResirkForumNor, Aquaculture Engineering Society.

Deputy board member of Sjølseng Eiendom AS (2008-).

Selected publications

Reports

- (2007) **Hatlen B, Ytrestøyl T, Bjerkeng B, Terjesen BF, Helland S.** Possible advantages of krill meal in feeds for aquaculture species. AKVAFORSK report 03/07. pp. 57. Sunndalsøra, Norway: AKVAFORSK.
- (2006) **Terjesen BF, Sigholt T, Holm J, Refstie S, Bæverfjord G, K-A. Rørvik, Åsgård T.** The impact of physical pellet characteristics and environmental conditions on stomach content separation in rainbow trout (*Oncorhynchus mykiss*). AKVAFORSK report 26/06. pp. 13. Sunndalsøra, Norway: AKVAFORSK.
- (2006) **Barr Y, Alne H, Berge G, Bæverfjord G, Espmark ÅM, Grisdale-Helland B, Hatlen B, Helland S, Lein I, Mørkøre T, Terjesen BF, Åsgård T.** Culture of cod and halibut – practices and requirements for research and development, with emphasis on nutrition. AKVAFORSK report 04/06. pp. 157. Sunndalsøra, Norway: AKVAFORSK
- (2006) **Terjesen BF, Barr Y.** Network activities within research and development of Atlantic cod juvenile production. Final report from Norwegian Research Council project 157149/S40. AKVAFORSK report 03/06. pp. 15. Sunndalsøra, Norway: AKVAFORSK
- (2005) **Terjesen BF, Hansen Aas G, Sørebo K, Barr Y, Ressem H, Ressem, E-M (2005).** Optimization of production protocols for intensive production of cod juveniles. Innovation Norway final report. AKVAFORSK report 16/05. pp. 61. Sunndalsøra, Norway: AKVAFORSK.
- (2005) **Terjesen BF, Barr Y, Lein I (2005).** Broodstock management of European hake and live-feed production protocols. AKVAFORSK report 13/05. pp. 55. Sunndalsøra, Norway: AKVAFORSK.
- (2004) **Terjesen BF, Hansen F, Skarpeid H-J, Barr Y, Aspmo S-I, Helland S (2004).** Crude saithe milt hydrolysates in live-feed enrichment formulations for larval fish: effects on lipid and fatty acids, amino acid pools, and peptide profiles of *Artemia franciscana*. AKVAFORSK report 8/04. pp. 17. Sunndalsøra, Norway: AKVAFORSK.
- (2003) **Terjesen BF, Lein I, Barr Y (2003).** Protocol for spawning in selective breeding programs for Atlantic cod. AKVAFORSK report 25/03. pp. 23. In Norwegian. Sunndalsøra, Norway: AKVAFORSK.

Peer-reviewed book chapters

- (2008) **Terjesen BF.** Nitrogen excretion. In: Finn RN and Kapoor BG (Eds.), Fish Larval Physiology. ISBN 978-1-57808-388-6. Science Publishers, New York. pp. 263-302.

Peer-reviewed journal papers

- (2008) **Gorodilov YN, Terjesen BF, Krasnov A, Takle H (2008).** Description of embryogenesis of Atlantic cod *Gadus morhua* L. The Open Marine Biology Journal, 2, 43-53.
- (2007) **Dabrowski K, Zhang Y, Arslan M, Terjesen BF (2007).** Indispensable amino acid deprivation does not cause rapid amino acid depletion in fish body and this principle has a potential to be used as the new strategy in nutrition. *Colombian Journal of*

Livestock Sciences (Revista Colombiana de Ciencias Pecuarias) 20, 508-511.

- (2007) **Dabrowski K, Arslan M, Terjesen BF, Zhang Y** (2007). The effect of dietary indispensable amino acid imbalances on feed intake: Is there a sensing of deficiency and neural signaling present in fish? *Aquaculture* 268, 136-142
- (2007) **Aas TS, Hatlen B, Grisdale-Helland B, Terjesen BF, Bakke-McKellep AM, Penn M, Helland SJ** (2007). Feed intake, growth and nutrient utilisation in Atlantic halibut (*Hippoglossus hippoglossus*) fed diets containing a bacterial protein meal. *Aquaculture Research* 38, 351-360.
- (2006) **Aas TS, Hatlen B, Grisdale-Helland B, Terjesen BF, Bakke-McKellep AM, Helland SJ** (2006). Effects of diets containing a bacterial protein meal on growth and feed utilisation in rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* 261, 357-368.
- (2006) **Park KH, Terjesen BF, Tesser MB, Portella MC, Dabrowski K** (2006). α -Lipoic acid-enrichment partially reverses tissue ascorbic acid depletion in pacu (*Piaractus mesopotamicus*) fed vitamin C-devoid diets. *Fish Physiol. Biochem.* 32, 329-338.
- (2006) **Aas TS, Grisdale-Helland B, Terjesen BF, Helland S** (2006). Improved growth and nutrient utilisation in Atlantic salmon (*Salmo salar*) fed diets containing a bacterial protein meal. *Aquaculture*. 259, 365-376.
- (2006) **Andersen Ø, Aas TS, Stugor S, Takle H, van-Nes S, Grisdale-Helland B, Helland S, Terjesen BF** (2006). Purine-induced expression of urate oxidase and enzyme activity in Atlantic salmon (*Salmo salar*). Cloning of urate oxidase liver cDNA from three teleost species and the African lungfish *Protopterus annectens*. *The FEBS Journal*. 273, 2839-2850.
- (2006) **Terjesen BF, Lee KJ, Zhang Y, Failla M, Dabrowski K** (2006). Optimization of dipeptide-protein mixtures in experimental diet formulations for rainbow trout alevins. *Aquaculture*. 254, 517-525.
- (2005) **Tesser MB, Terjesen BF, Zhang Y, Portella MC, Dabrowski K** (2005). Free- and peptide-based arginine dietary supplementation for the South American fish pacu (*Piaractus mesopotamicus*). *Aquaculture Nutrition*. 11, 443-453.
- (2005) **Dabrowski K, Terjesen BF, Zhang Y, Phang J, Lee K-J** (2005) A concept of dietary dipeptides: a step to resolve the problem of amino acid availability in early life of vertebrates. *J. Exp. Biol.* 208, 2885-2894.
- (2004) **Terjesen BF, Park K, Tesser MB, Portella MC, Zhang Y, Dabrowski K** (2004). Lipoic acid and ascorbic acid affect plasma free amino acids selectively in the teleost fish pacu (*Piaractus mesopotamicus*). *J. Nutr.* 134, 2930-2934.
- (2004) **Gjerde B, Terjesen BF, Barr Y, Lein, I, Thorland, I** (2004). Genetic variation for juvenile growth and survival in Atlantic cod (*Gadus morhua*). *Aquaculture* 236, 167-177.
- (2003) **Rønnestad I, Tonheim SK, Fyhn HJ, Rojas-García CR, Kamisaka Y, Koven W, Finn RN, Terjesen BF, Barr Y, Conceição LEC** (2003). The supply of amino acids during early feeding stages of marine fish larvae: A review of recent findings. *Aquaculture* 227, 147-164.
- (2003) **Helland S, Terjesen BF, Berg L** (2003). Free amino acid and protein content in a planktonic copepod compared to *Artemia franciscana*. *Aquaculture* 215, 213-228.
- (2002) **Terjesen BF, Finn RN, Norberg B, Rønnestad I** (2002). Kinetics and fates of ammonia, urea, and uric acid during oocyte maturation and ontogeny of the Atlantic halibut (*Hippoglossus hippoglossus* L.). *Comp. Biochem. Physiol. A* 131, 443-455.

Other publications

- (2008) **Sonesson AK, Terjesen BF, Grisdale-Helland B, Mørkøre T, Rye M, Refstie T, Babiak I, Fjalestad K, Kettunen A, McAndrew B** (2008). Review on breeding and reproduction of European aquaculture species. Atlantic cod (*Gadus morhua*). Review for AQUABreeding EU project FP6-2005-SSP-044424. 10 pp.
- (2007) **Mangor-Jensen A, Terjesen BF, van der Meeren T, Harboe T** (2007). Fish welfare in juvenile cultures. In: Coast and Aquaculture 2007, "Kysten og havet", special issue no. 2, 2007. Eds: Dahl E, Hansen PK, Haug T, Karlsen Ø. p. 148-150. Institute of Marine Research, Bergen, Norway.
- (2006) **Mangor-Jensen A, Øiestad V, van der Meeren T, Lein I, Harboe T, Opstad I, Øie G, Rainuzzo J, Evjemo JO, Reitan KI, Terjesen BF** (2006). From extensive to intensive culture of marine fish. In: Mariculture Research: From cage to food. Eds: Thomassen M, Gudding G, Norberg B, Jørgensen L. (In Norwegian). p. 76-94. The Research Council of Norway, Oslo, Norway.

Selected presentations

Conference papers

- (2008) **Terjesen BF, Ulgenes Y, Fjæra SO, Summerfelt ST, Brunsvik P, Baeverfjord G, Nerland S, Takle H, Norvik OC, Kittelsen A** (2008). RAS research facility dimensioning and design: A special case compared to planning production systems. *In* Aquaculture Engineering Society Issues Forum, proceedings. p. 223-238. Roanoke, Virginia, 23rd-24th July, 2008.
- (2008) **Ulgenes Y, Attramadal K, Terjesen BF** (2008). The motivation for using recirculation in Norway - A shift from the need for restricted water consumption to better control of the culture water environment and higher product quality. *In* Aquaculture Engineering Society Issue Forum, proceedings. p. 80-92. Roanoke, Virginia, 23rd-24th July, 2008.
- (2008) **Terjesen BF, Sigholt T, Hillestad M, Holm J, Refstie S, Baeverfjord G, Aas TS, Rørvik K-A, Åsgård T** (2008). The impact of physical pellet characteristics and environmental conditions on stomach content separation in rainbow trout. *In* 7th International Conference on Recirculating Aquaculture, proceedings. p. 378-387. Roanoke, Virginia, 25th-27th July, 2008.
- (2008) **Rørvik K-A, Alne H, Thomassen M, Terjesen BF, Refstie S, Alsgård T, Takle H, Oehme M, Zambonino J., Sigholt T** (2008). Dynamic and integrated production biology of farmed salmon in sea. *In* Norwegian Research Council Mariculture Program Conference Book of Abstracts. Mariculture Program Conference 2008.
- (2007) **Dabrowski K, Zhang Y, Arslan M, Terjesen BF** (2007). Indispensable amino acid deprivation does not cause rapid amino acid depletion in fish body. *In* Abstract book: Aquaculture 2007, World Aquaculture Society, St. Antonio, USA 26th-2nd February-March, 2007.
- (2006) **Terjesen BF, Aas TS, Skugor S, Takle H, van Nes S, Grisdale-Helland B, Helland SJ, Andersen Ø** (2006). Purine nitrogen metabolism in the Atlantic salmon: effects of dietary nucleic acids with focus on urate oxidase. In Program and Abstracts XII International Symposium on Fish Nutrition & Feeding, O10, p. 40. 28 May - 1 June 2006, Biarritz, France.
- (2006) **Zhang Y, Terjesen BF, Tesser MB, Portella MC, Dabrowski K** (2006). Dietary

arginine supplementation form did not change hepatic arginase activity in juvenile South American fish Pacu (*Piaractus mesopotamicus*). In Abstracts of Third Annual Nutrition Research Symposium. The Graduate Society of Nutritional Sciences at The Ohio State University. p. 2. June 2006, Columbus, Ohio. U.S.A.

- (2006) **TS Aas, Ø Andersen, S Stugor, H Takle, S van-Nes, B Grisdale-Helland, BF Terjesen, SJ Helland** (2006). Nitrogen metabolism in Atlantic salmon fed diets with increasing levels of BioProtein (In Norwegian). *In Norwegian Research Council Mariculture Program Conference Book of Abstracts. Mariculture Program Conference 2006, Bergen, Norway (29th-31st March, 2006)*
- (2005) **Barr Y, Terjesen BF, Helland S** (2005). Intensive short term enrichment employing liposomes – an efficient method for enhancing water and lipid soluble components in live feed. *In Larvi '05 – 4th Fish & Shellfish Larviculture Symposium, Special Publication No. 36, eds. C. I. Hendry G. Van Stappen M. Wille and P. Sorgeloos, p. 15-18. Ghent, Belgium: European Aquaculture Society (5th-8th September, 2005).*
- (2005) **Dabrowski K, Arslan M, Zhang Y, Terjesen BF** (2005). Amino acid imbalances in fish diets – new strategy for an old problem. *Larvi '05 – 4th Fish & Shellfish Larviculture Symposium, Special Publication No 36. eds. C. I. Hendry G. Van Stappen M. Wille and P. Sorgeloos, p. 105-106. Ghent, Belgium: European Aquaculture Society (5th-8th September, 2005).*
- (2005) **Dabrowski K, Hliwa P, Gomulka P, Sienicki M, Carvalho A, Ostaszewska T, Terjesen BF** (2005). Studies on the utilization of free amino acids and casein formulated diets in rearing common carp larvae. *In Abstract book: Aquaculture America 2005, p. 90. World Aquaculture Society, New Orleans, USA (17th-20th January, 2005).*
- (2005) **Zhang Y, Terjesen BF, Tesser MB, Portella MC, Dabrowski K** (2005). Arginase activity and plasma urea in pacu *Piaractus mesopotamicus* fed arginine in different molecular forms. *In Abstract book: Aquaculture America 2005, p. 506. World Aquaculture Society, New Orleans, USA (17th-20th January, 2005).*
- (2004) **Park K, Tesser MB, Terjesen BF, Zhang Y, Portella MC, Dabrowski K** (2004). New purified–diet formulations for nutritional requirement studies in the tropical fish pacu, *Piaractus mesopotamicus*. *In VI International Congress on the Biology of Fishes, Fish culture performance in the tropics symposium, p. 15-19. Manaus, Brazil (1st-5th August, 2004).*
- (2004) **Terjesen BF, Lee K-J, Dabrowski K** (2004). Amino acid requirement studies in fish early life stages: What to feed and which indicators to use? *Alltech's 20th International Feed Industry Symposium. In Proceedings (Suppl. 1): "Nutritional Biotechnology in the Feed and Food Industries", p. 110. Lexington, Kentucky, USA (23rd-26th May, 2004).*
- (2004) **Aas TS, Grisdale-Helland B, Terjesen BF, Helland SJ** (2004). Bacterial protein as a protein source in diets for Atlantic salmon (*Salmo salar*). *In Proceedings of the XI International Symposium on Nutrition and Feeding in Fish (XI ISNFF), O44, Phuket, Thailand (3rd-7th May, 2004).*
- (2004) **Tesser MB, Dabrowski K, Terjesen BF, Pizauro JM, Portella, MC** (2004) Free-and peptide-based arginine supplementation into arginine-deficient diets for South American fish, *Piaractus mesopotamicus*. *In Abstract book: Aquaculture 2004, p 63. World Aquaculture Society, Hawaii, USA (2nd-7th March, 2004).*
- (2003) **Gjerde, B, Terjesen, BF, Barr Y, Lein I, Thorland, I** (2003) Genetic variation for early growth in Atlantic cod (*Gadus morhua*). *In Proceedings of the VIIIth International Symposium of Genetics in Aquaculture, p. 116. Puerto Varas, Chile (9th-15th*

November, 2003).

- (2002) **Terjesen BF, Barr Y, Lein I, Eliassen J-E, Lein R, Tanem I, Kjørsvik E, Galloway T, Gjerde B** (2002) Development of a production line for full-sib groups of Atlantic cod. *In* Norwegian Research Council Program Conference Book of Abstracts, p. 78, Aquaculture Programme, Tromsø, Norway (16th-18th September, 2002).
- (2002) **Åsgård T, Terjesen BF, Mørkøre T, Eliassen J-E** (2002). Cod culture - the advances and future of the industry. *In* The Aqua Sur International Conference, 18th-19th March 2002, Puerto Montt, Chile.

Popular science articles

- (2003) **Gjerde B, Terjesen BF, Barr Y, Lein I, Thorland I** (2003). Large genetic variation in growth potential in Atlantic cod (In Norwegian). *Norsk Fiskeoppdrett* **28**, issue 17, p. 40-41.
- (2001) **Eliassen J-E, Terjesen BF, Barr Y** (2001). Cannibalism in farmed cod can be reduced (In Norwegian). *Norsk Fiskeoppdrett* **26**, issue 17, p. 37. Also posted at IntraFish.com 27th of September 2001.