

**A report on completion of a three week internship in Canada to
determine GSM/MIB in fish-flesh**

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Project No. 2013/719

This project was conducted by



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Australian Government

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PROJECT NO: TITLE:

Seafood CRC Research Travel Grant 2013/ 219 - To gain hands-on training and experience to determine GSM/MIB (taint causing agents) in Barramundi (*Lates calcarifer*).

PRINCIPAL INVESTIGATOR: Mr Priyantha Hathurusingha and Dr K R (Ken) Davey

ADDRESS: The School of Chemical Engineering, The University of Adelaide, SA 5000

OBJECTIVES OF RESEARCH TRAVEL:

1. To gain hands on experience to determine GSM/MIB in Barramundi fish-flesh
2. To acquire technical skills to optimize sample pre-concentration, recovery and reproducibility
3. To undertake a training course on Solid Phase Micro-Extraction (SPME) method development.

NON TECHNICAL SUMMARY:

This short-term internship was undertaken at two Universities in Canada over 22 days, commencing 18 November, 2013. The first phase of the program was based at Laval University, Quebec and the second phase was based at The University of Waterloo, Ontario, Canada.

The training at Laval University involved hands-on experience of preparation and analysing off-flavour compounds in fish-flesh. In addition, it covered the mandatory Workplace Hazardous Materials Information System course, visiting the Recirculated Aquaculture Facilities and becoming familiar with the state-of-the-art instrument for quantifying the off-flavour molecules.

The main objective of visiting Waterloo University was to undertake the SPME (Solid Phase Micro- Extraction) course which addressed the required theoretical aspect for the method development for the analysis of volatile and semi- volatile compounds in fish-flesh.

OUTCOMES ACHIEVED TO DATE:

1. Trained in the micro-wave digestion system for the analysis of off-flavour compounds in fish samples.
2. Training in the method development to gain lower detection and maximum recovery of molecules of interest.
3. Gained knowledge of the specification and the potential suppliers of the required parts for the micro-wave digestion system (this is now being commissioned at the Workshops, School of Chemical Engineering, The University of Adelaide).
4. Built a network with experts in the area with potential for further collaboration (under discussion).

BACKGROUND AND NEED:

Analysis of taint causing molecules (GSM/MIB) in Barramundi fish-flesh (*Lates calcarifer*) is an essential part of the PhD experimental program of Mr Priyantha Hathurusingha. This specialist training is not available in Australia. The University of Laval, Canada agreed to provide him with this training at no cost.

RESULTS:

1. Enhanced understanding of Recirculating Aquaculture System facilities.
2. Trained in how to undertake fish and water sampling and handling, preparation, and extraction for taint quantification.
3. Acquired the necessary technical skills to optimise sample pre-concentration, recovery and reproducibility.
4. Received instrument training (GC/MS) – optimisations and working with the auto sampler.
5. Trained on non-destructive taint determination in parallel to the destructive methods.
6. Certified as completed for Solid Phase Micro- Extraction.

PROJECT OUTCOMES:

This training plays a valuable tool in validating a predictive model for off-flavour (taint), which will assist Barramundi farmers to reduce taint level in their fish at harvest.

SUMMARY OF CHANGE IN INDUSTRY:

Established protocols and experience in Australia for quality sampling of fish.

WHAT FUTURE AND ONGOING CHANGES ARE EXPECTED?

n/a

WHAT BARRIERS ARE THERE FOR CHANGES TO OCCUR?

n/a

IF NOT ALREADY HAPPENING, WHEN WILL THE CHANGES OCCUR?

(e.g. 2 businesses will adopt project findings and two more are expected to adopt findings within 12 months)

n/a

WHAT IS THE LIKELIHOOD THAT THESE CHANGES WILL OCCUR?

(e.g. 50% chance that four businesses will adopt project findings)?

n/a

WHAT BARRIERS ARE THERE TO ADOPTION OF THESE CHANGES AND WHAT ACTION COULD BE TAKEN TO OVERCOME THESE?

(e.g. to adopt project findings will require group training/sharing equipment/invest additional capital etc.)

n/a

WHAT IS THE OUTPUT THAT NEEDS TO BE COMMUNICATED?

The method of analysis of taint causing molecules (GSM/MIB) in fish-flesh.

WHO IS/ARE THE TARGET AUDIENCE/S?

QDAF via Dr Sue Poole; Australian Barramundi Farmers Association

WHAT ARE THE KEY MESSAGES?

Quantitative and careful analysis of taint molecules is critical to the testing of a predictive model for taint which can be used to assist the RAS Barramundi farming industry in Australia.

WHAT IS THE CALL TO ACTION?

(What is it you want people to do once you communicate the key message to them –i.e. what change of behaviour or action do you want them to take?)

n/a

COMMUNICATION CHANNELS:

| <i>Channel</i> | <i>Who by</i> | <i>When</i> |
|---|--|-------------|
| Refereed publication in scientific literature | Mr Priyantha Hathurusingha Dr K R (Ken) Davey | - tba |
| Directly to QDAF | Mr Priyantha Hathurusingha Dr K R (Ken) Davey | tba |

WHAT IS YOUR FEEDBACK?

This important method can be applied for analysing a range of fish types and other volatile and semi-volatile compounds present in fish-flesh. This would lead to further research to accurately characterise off flavour in seafoods.

FURTHER ACTION REQUIRED IN REGARDS TO COMMERCIALISATION?

(e.g. IP protection, licensing, sales, revenues etc)

n/a

ACKNOWLEDGEMENTS:

We are very grateful to Dr Grant Vandenberg for generously assisting Mr Priyantha Hathurusingha to travel to Canada to receive this important training and to The University of Adelaide for additional travel funds.

We are very grateful for the financial support received from CRC Seafood Australia through this travel grant for this internship. This will be acknowledged in all future publications and communications by us.

APPENDIX:

Completion Certificate for SPME - appended below:

