Practical strategies for GHG reduction through aquaculture feeds – A commercial perspective

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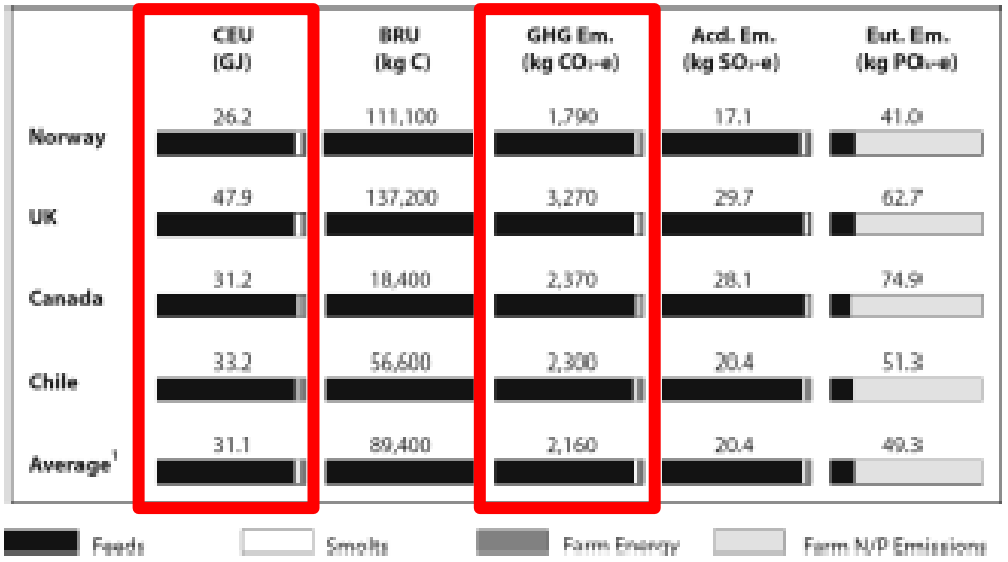
Aquafeeds: Energy and GHG Emissions

TABLE 2. Life Cycle Impact Assessment (Both Total Impacts and Proportional Contributions) for the Production of One Live-Weight Tonne of Salmon in Norway, UK, Chile, and Canada in 2007, Including the Production-Weighted Global Average (For Breakdown of Values See Table S7)



Source: Pelletier et al., 2009

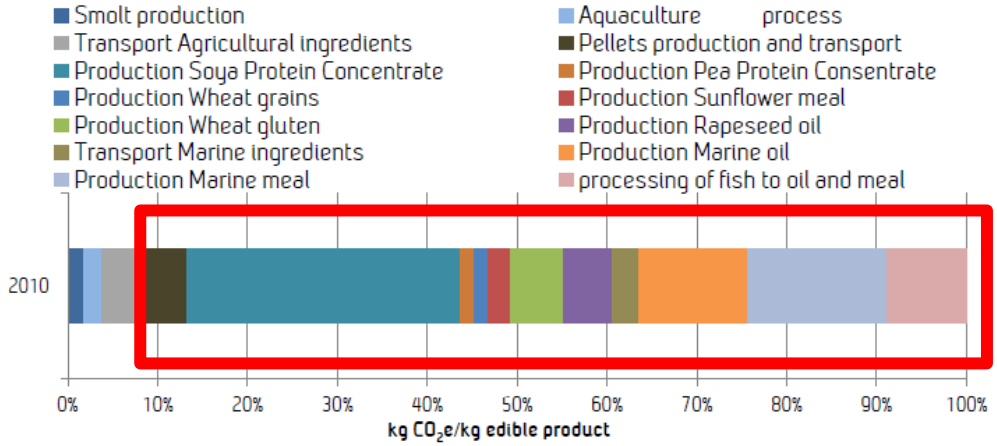


Figure 4-2 Contribution (in %) from different processes to the carbon footprint of the 2010 salmon

Source: Nofima, 2011

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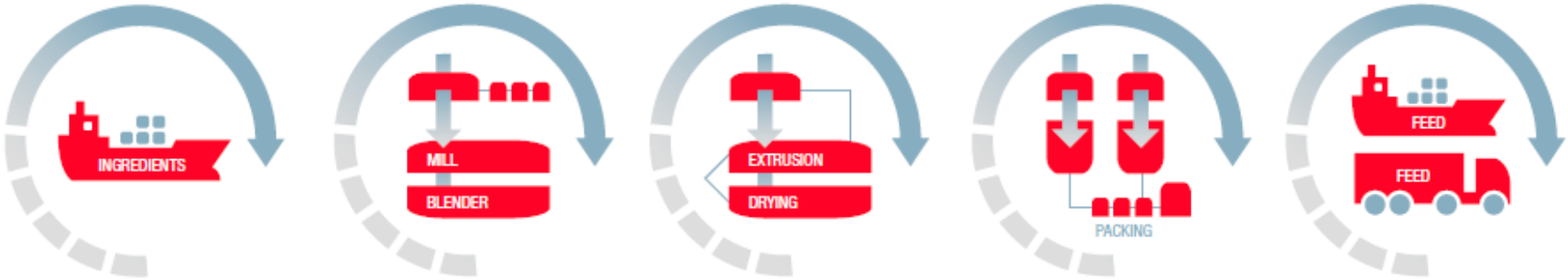
Aquqfeed Production Process



Transport of ingredients by sea

Weighing, dosing, milling and mixing ingredients

Extrusion and drying

Adding oil, cooling, packing, quality control and labelling

Transport by sea and road

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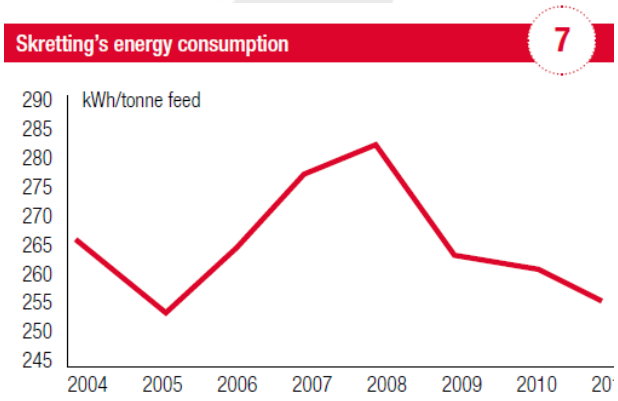
Strategies to Reduce Direct Impacts



Calculation and disclosure

Energy efficiency

Outbound Logistics

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Aquafeeds: Energy and GHG Emissions

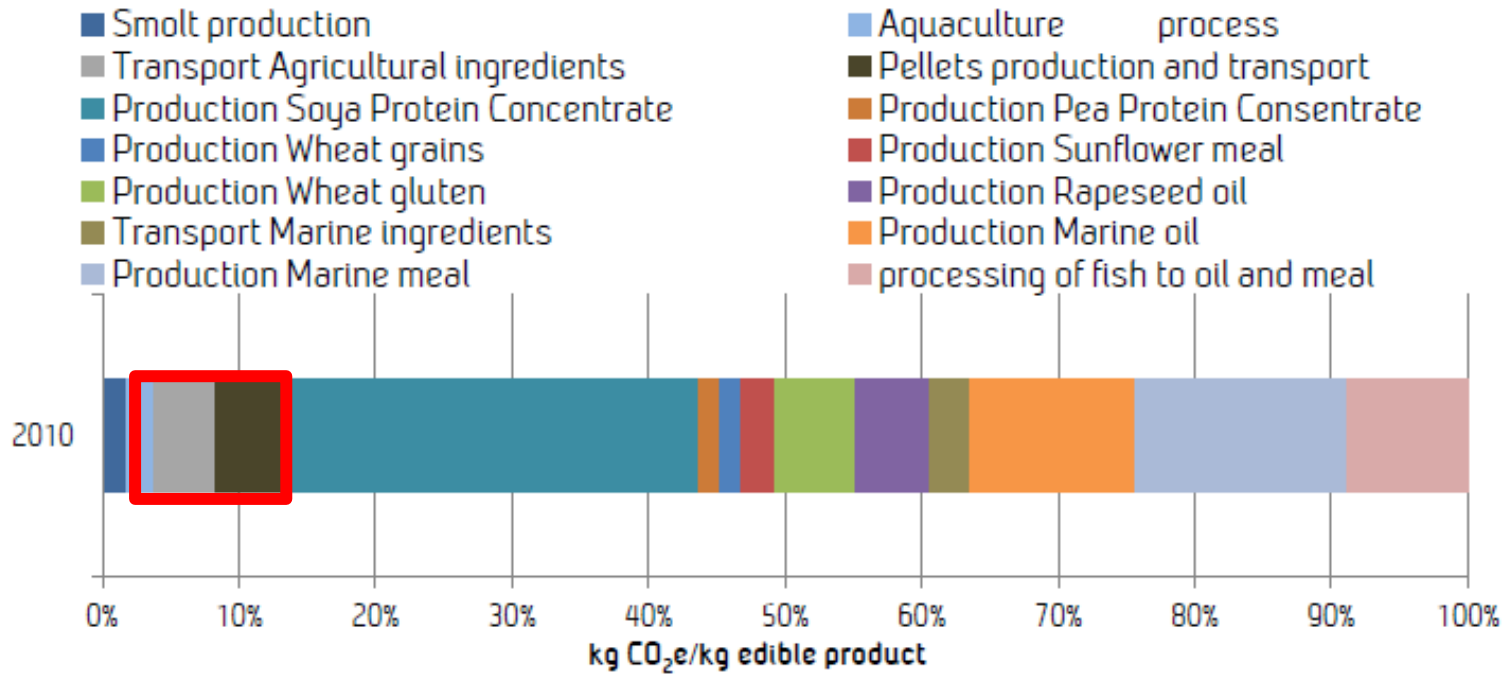

Figure 4-2 Contribution (in %) from different processes to the carbon footprint of the 2010 salmon

Source: Nofima, 2011

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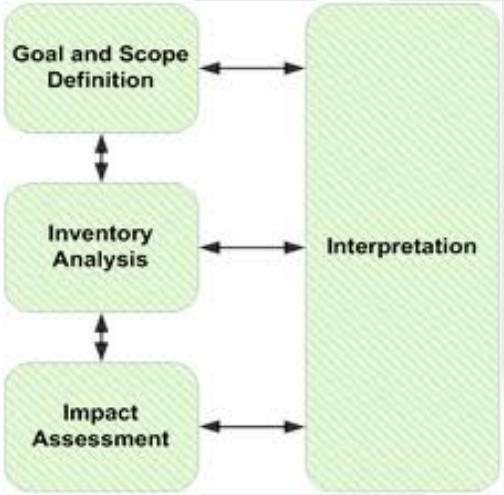
Practicality of LCA Limited by…

Time required to collect and analyse data

Quality of inventory data from existing databases



Varying methodological approaches and assumptions

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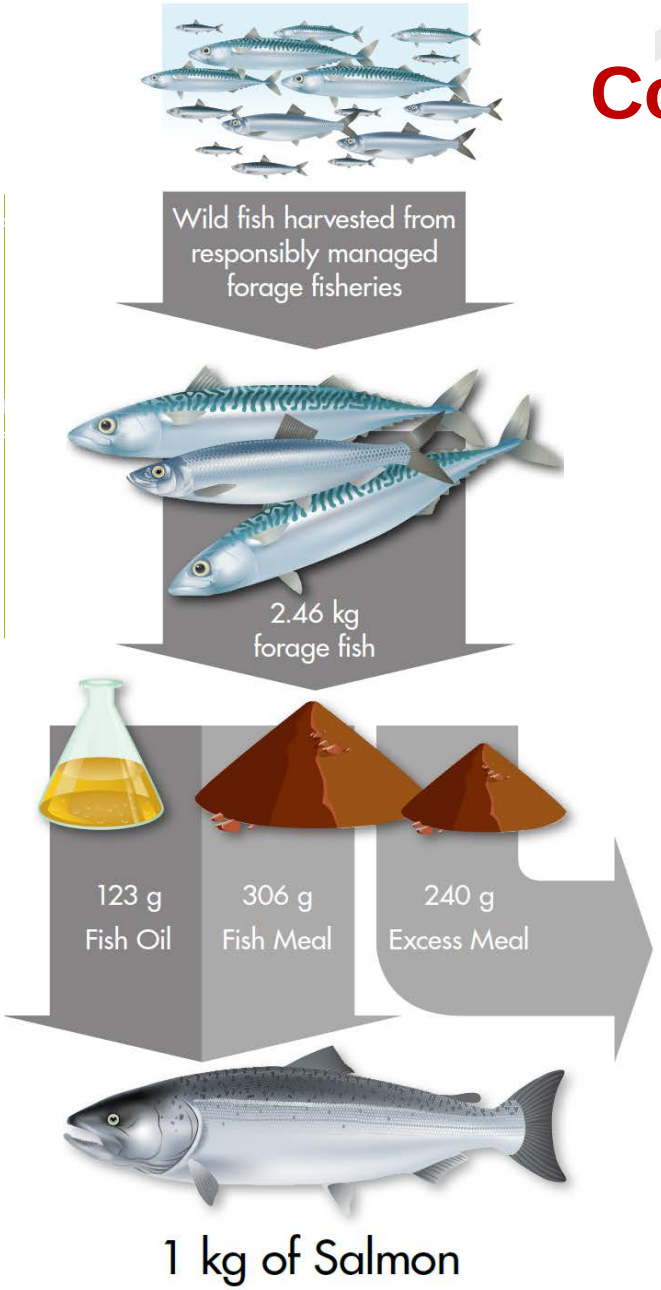
Conflicting Sustainability Metrics



Source: Tassal, 2011

CO_2e- footprint of animal proteins (energy allocation)

Protein Meals	Kg CO2e-/t
Dedicated Reduction Fisheries	
Anchovetta meal	820
Herring meal	1,279
Krill meal	2,726
Fisheries By-products	
Whitefish meal	5,330
Skipjack tuna meal	3,088
Albacore tuna meal	10,518
Land Animal Proteins	
Poultry meal	3,360

Source: Pelletier et al., 2009; White, 2012

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Strategies to Reduce Upstream Impacts

Improving FCR

Industry Initiatives

Customer Factsheets

References

- Pelletier, N., Tyedmers, P., Sonesson, U., Scholz, A., Ziegler, F., Flysjo, A., & ...Silverman, H. (2009). Not all salmon are created equally. *Environ. Sci. Technol., 43*(23), 8730-8736. doi: 10.1021/es9010114
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- Ytrestoyl, T., Aas, T., Berge, G., Hatlen, B., Sorensen, M., Ruyter, B., & Asgard, T. (2011). *Resource utilisation and eco-efficiency of Norwegian salmon farming.* (No. 53). Tromso, NO: NOFIMA.

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