DATA ANALYTICS IN AQUACULTURE

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Aquaculture in 2016
Study Targets

Sea Bream

Sea Bass
Aquaculture Workflow

Unit. The group of production indicating localization (also known as cage).
Batch. The individual production series of fish.
Types of Data

**Continuous** – measured quantities expressed as a float (e.g. ‘av. weight’);
**Discrete** – count expressed as an integer (e.g. ‘number of fish’);
**Regular categorical** – data including non-ordered classes (e.g. species Bream/Bass);
**Ordinal** – classes that can be ordered in levels (e.g. estimations poor/fair/good).

Variables that **do not change over time**, often identifying population attributes (e.g. identifications such as ‘year’ or ‘hatchery’);
Variables that can **change over time** but do not change within a sampling period (e.g. ‘batch’);
Variables that **change daily**, considering samplings (e.g. ‘average weight’).
**Identification data.** This is the data that permits the fish farmer to manage the production and correctly identify the fish;

**Daily data.** This is the data that is provided by the fish farmers resulting from their everyday data input (e.g. ‘date’, ‘av. wt.’, ‘actual feed’, etc.);

**Sampling data.** At predetermined points of the fish growth timeline, a sample of the fish is done to confirm the model values and make the appropriate adjustments;

**Life To Date [LTD].** This is cumulative data that is calculated from the time when the fish enters the net as a fry to the date of data collection, and will last until the date of the harvest.
Direct values – values that correspond to the direct observation of the aquafarmers on either variables values including small errors measured in the field (e.g. sampling measures such as average weight) or precise values provided by external sources (e.g. water temperature or oxygen level);

Calculated values – values that are dependent of a number of other observed values (e.g. LTD values calculated from the daily data);

Derived values – values deriving from previously available calculation tables (e.g. FCR calculated from the table, given average weight and water temperature).
Data Input by fishfarmer

Interactive GUI

Syntactic Cleaning

Semantic Cleaning

Metadata
Feed Conversion Ratio (FCR)

**Net growth** = Biomass at the end of the period – Initial Biomass + Biomass of harvests + Biomass transferred to other units – Biomass transferred from other units

**Gross growth** = Net growth + Biomass of mortalities + Biomass of culling + Biomass of adjustments

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Economical\ FCR = \frac{\text{Total dry feed given}}{Net\ growth}
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Biological\ FCR = \frac{\text{Total dry feed given}}{Gross\ growth}
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SFR = \frac{\text{Daily feed}}{Biomass} \times 100
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Feed Conversion Ratio (FCR)
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Company A
real data
FCR model

Company B

Company C
aquaSmart Public Interface
Improvement of efficiency