

Saving money in your brewhouse

Process optimisation in mash conversion and cereal cooking

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Our offerings



At DuPont, we empower the world with the essential innovations to thrive, by discovering and delivering results that matter

Our global team of researchers and industry experts and the DuPont portfolio of **Brewing enzymes** can help you create new beers and unique beer styles, yet ensure you maximize efficiency, ensure consistency and protect the quality of every brew you make.

[Biosciences.dupont.com/brewing](https://biosciences.dupont.com/brewing)



Briggs of Burton specialises in delivering high-quality process engineering for the Brewing industry worldwide.

Our long heritage in brewing has meant we have delivered many Brewing projects globally.

We have been particularly active in the design, expansion and build of new Breweries in the UK, Americas and Africa.

briggsplc.com/brewing

What is the optimum? Depends upon you – some combination of:

Operational cost factors



- Raw material
- Energy-costs/
consumption,
- Brewhouse yields
- Use of processing aids
(like enzymes)

Investment factors



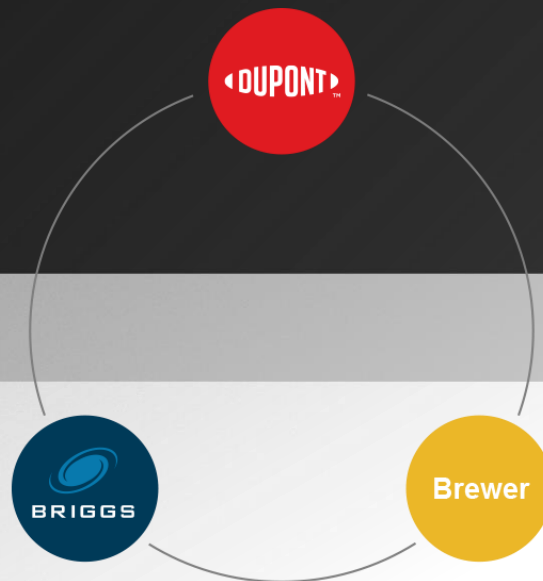
- Capital cost
- Implementation speed

Environmental factors



- Carbon footprint
- Sustainability importance

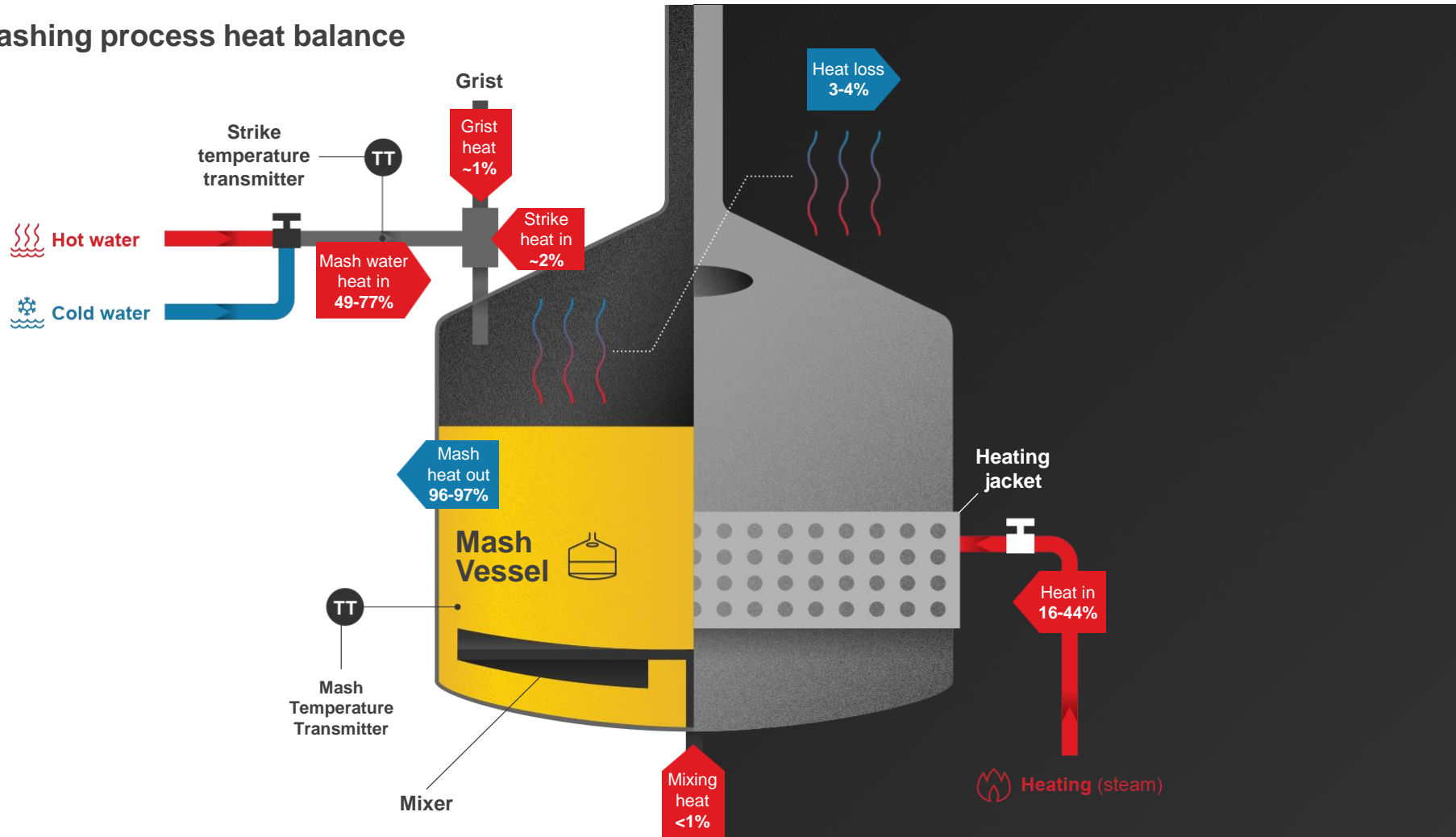
**Different for any
particular brewery**



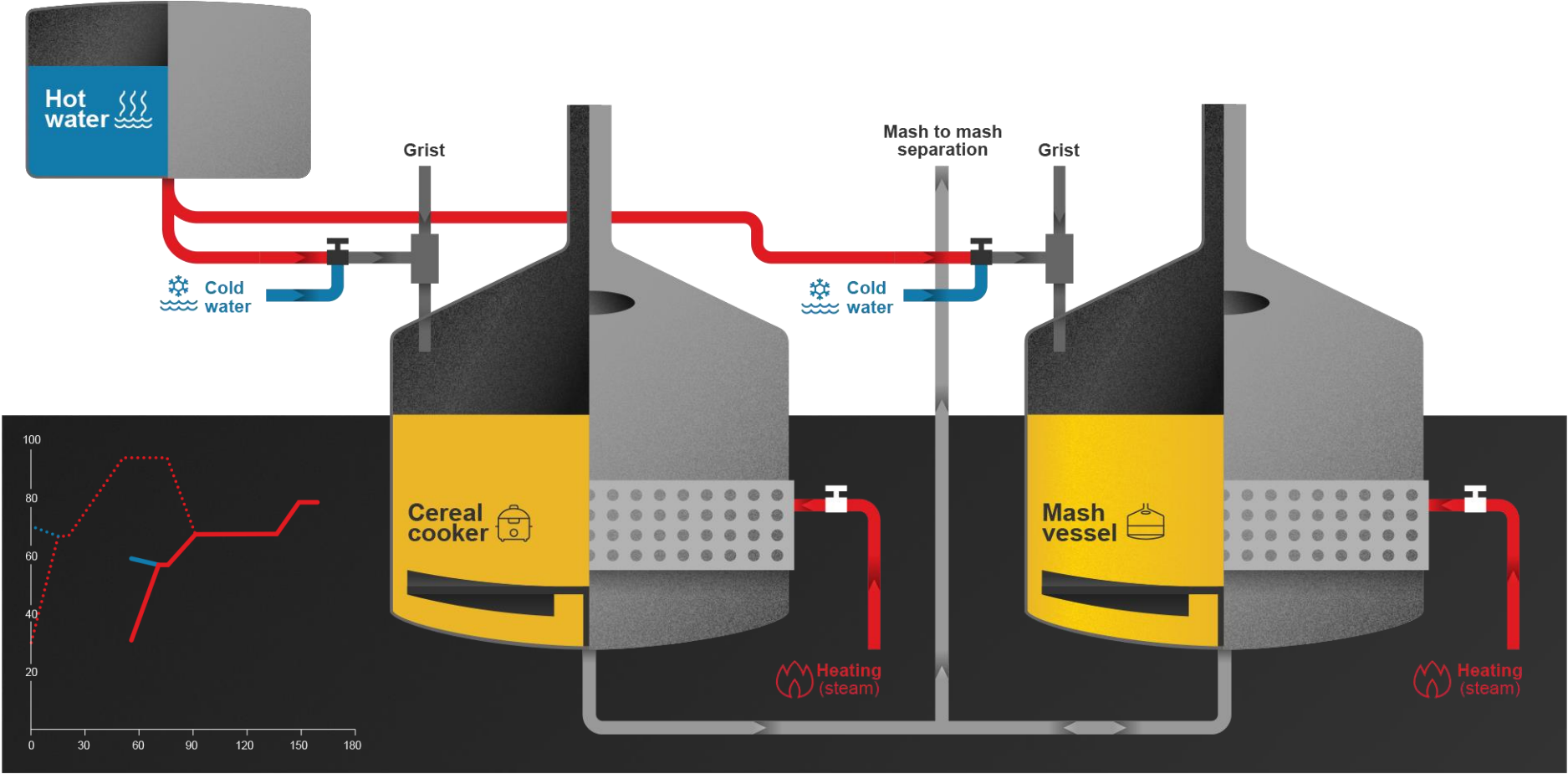
Common needs

1. Understand energy consumption during mashing / cooking
2. Tool for higher understanding of impact of different raw materials & processes
3. Sharing knowledge and learning together

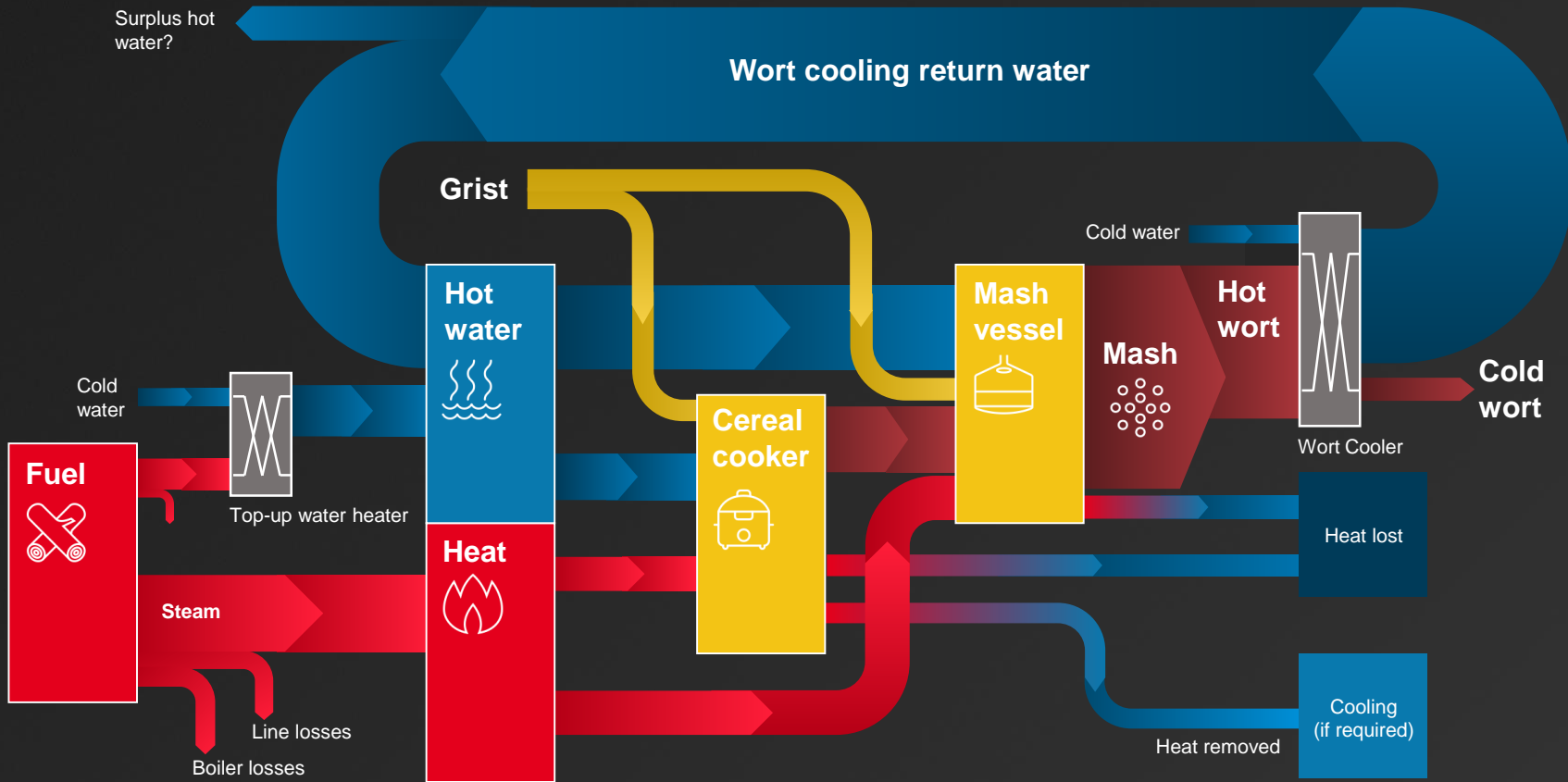
Mashing process heat balance



Single decoction mashing system



Sankey diagram of single decoction mashing



The model

Compare current case (Control) with an Option

Mash Profile

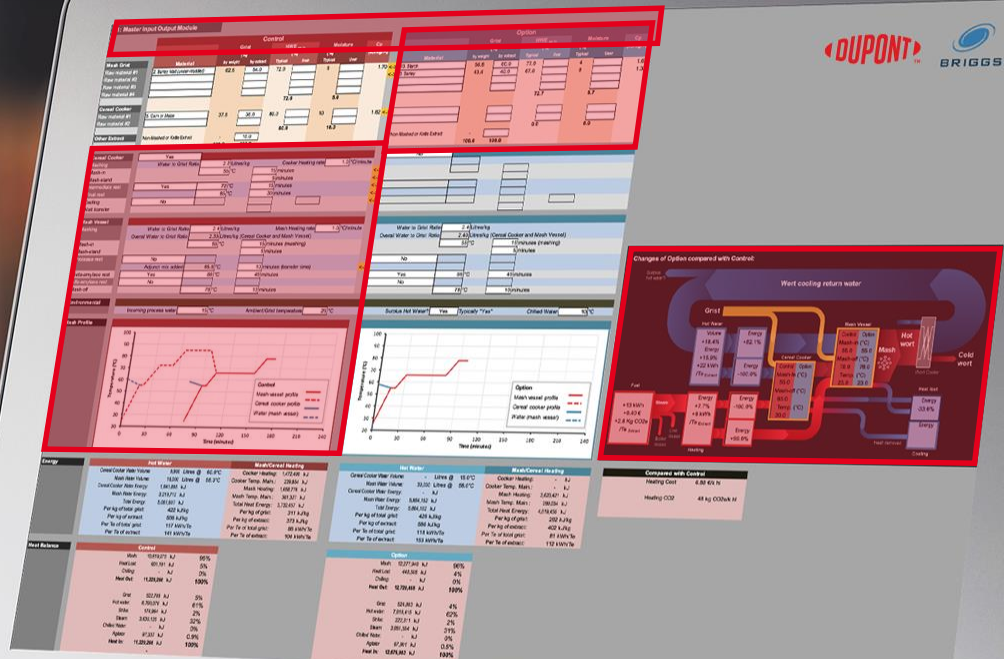
- Dynamic simulations allowed
- Visual representation

Grist composition

- Standard data from database
- Or user specified

Output

- Visualized in Sankey Diagram
- Energy comparison for Cereal cooking and mash heating
- Relative changes per tonne extract
- Cost change per 1000 hl
- Standard/user fuel costs
- Carbon equivalent changes



Example 1 - All Malt vs Malt + Local Adjunct (Corn)

1. Material

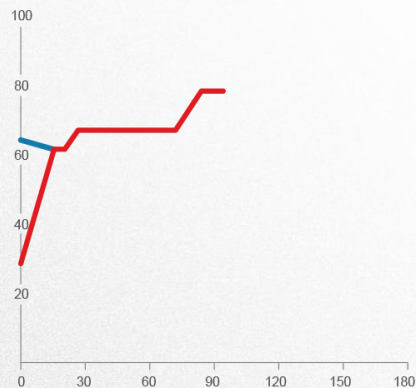


Barley malt

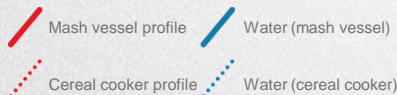


Corn / maize

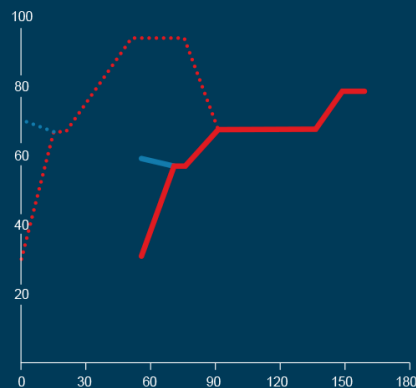
2. Control



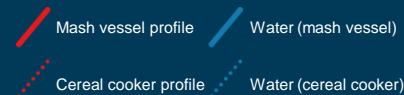
- All malt
- Classic infusion
- Enzymes for mash separation



3. Option



- Malt + Adjunct (Corn)
- Adjunct cooked at 95°C
- Enzyme addition
- Thick adjunct mash



4. Processing

- 1 Infusion vs decoction
- 2 100% Malt vs 70% Malt / 30% Maize
- 3 Maize cooked at 95°C

Outputs:

(1Mhl/year):



+ € 32 000 / year
of heating cost



~ €800 000 raw
material saving

Cereal
cooker
required



A more
sustainable
solution



Example 2 - Malt/Maize (Cooking 99°C v 85°C)

1. Material

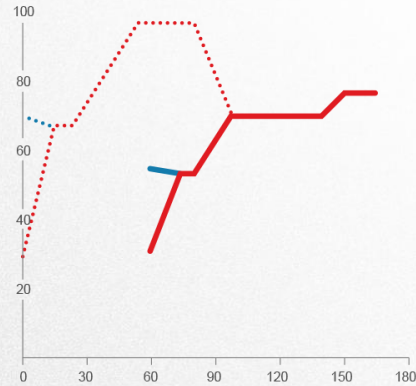


Barley malt

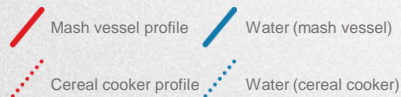


Corn / maize

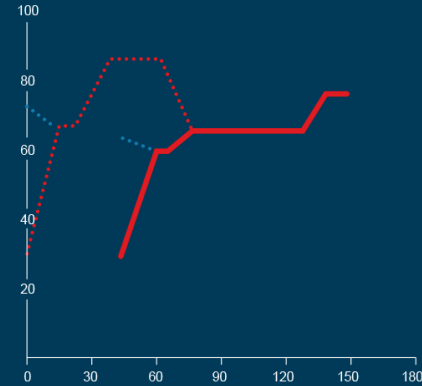
2. Control



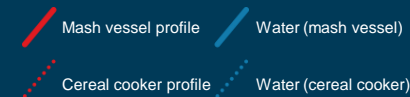
- Classic Decoction
- Adjunct cooked at 99°C



3. Option



- Classic Decoction
- Adjunct cooked at 85°C
- Enzyme addition
- Thicker adjunct mash



4. Processing

- 1 Different decoction temp. – 99°C vs 85°C
- 2 60% Malt / 40% Maize
- 3 Thicker adjunct mash + Enzymes

Outputs:
(1Mhl/year):



€ 60,000
saving / year
of heating cost



Lower carbon
equivalent
(320Te CO2/yr.)

Example 3 - Malt/Sorghum (Classic v infusion)

1. Material

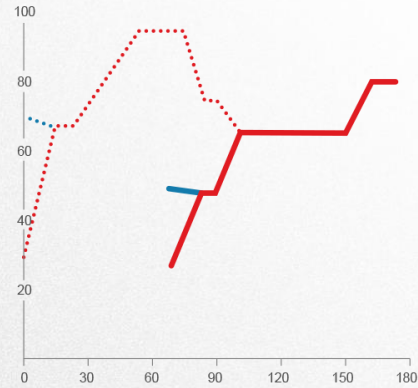


Barley malt

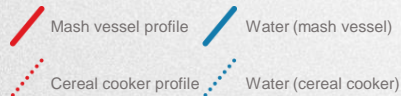


Sorghum

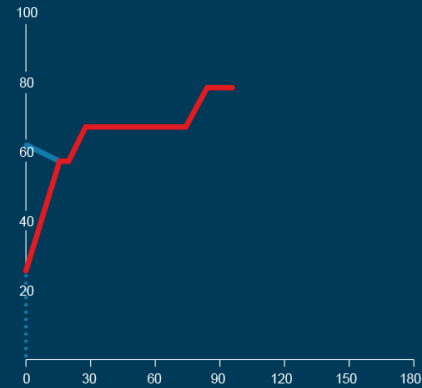
2. Control



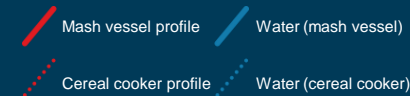
- Classic decoction
- Cooling through chilled water addition



3. Option



- Single vessel infusion
- Use of enzymes



4. Processing

- 1 Decoction vs infusion ('one vessel')
- 2 40% Malt / 60% Sorghum
- 3 Chilled water cooling & use of enzymes

Outputs:
(1Mhl/year):



€ 90,000 / year
Saving on
heating/cooling



No cereal
cooker required

Conclusions



**Optimum depends
on you**

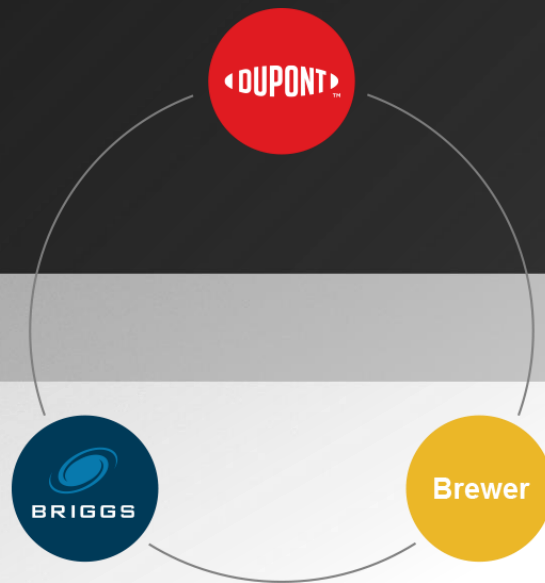


Using the tool

- Needs expertise
- Local knowledge/
customisation



**Let's start
a dialogue**



We can support you to

1. Understand energy consumption during mashing / Cooking
2. Getting a higher understanding of impact of different raw materials & processes
3. Sharing knowledge and learning together