

# PUCK PREPARATION TOOL THE HOG

AN OTHER EXAMPLE OF HOW THE DECENT ESPRESSO MACHINE CAN  
HELP UNDERSTAND HOW ESPRESSO WORKS!

STÉPHANE RIBES – JUNE 2019

# THE HOG – SUMMARY



## Benefits

- **Reduced edge channeling**
- Quicker wetting of the coffee puck → **More even preinfusion & extraction**
  - ✓ reduced temperature gap between top and bottom grinds
  - ✓ lower concentration gradient of the extracting fluid between top and bottom grinds
  - ✓ reduced negative impacts of slow preinfusions
  - ✓ less puck compression with high preinfusion flow rates
- **More stable pressure** (flow profile with constant flow)
- Smoother evolution of the extraction yield → **better control of the extraction in the typical range of brew ratio**, when reaching the highest possible extraction is not the most desirable objective

## Additional information

- Requires a finer grind
- Represents an additional step in the puck preparation (does not replace grinds distribution)

# THE HOG – DESCRIPTION

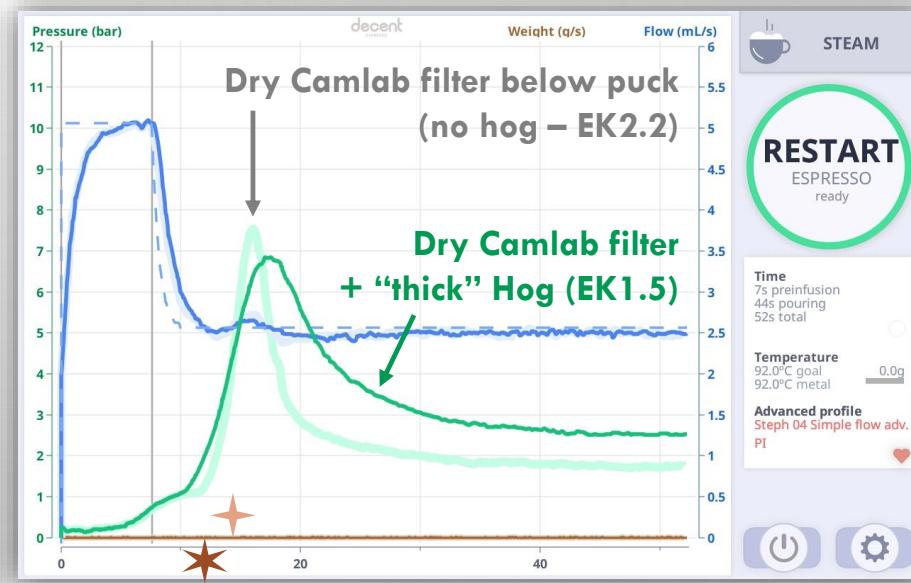
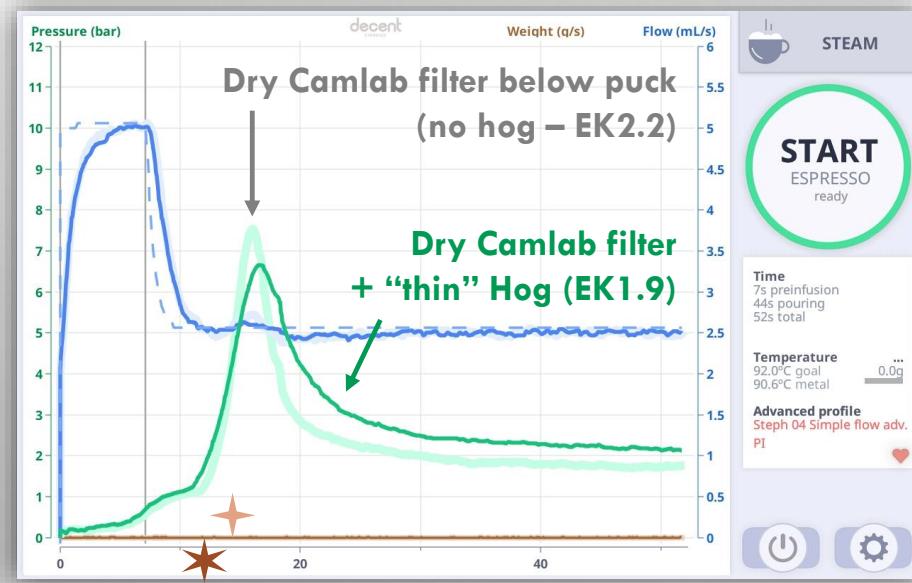


- First introduced by **Barista Hustle** (Matt Perger) in 2017:  
<http://community.baristahustle.com/t/lets-talk-about-the-hog/2000>
- The 2 hog tools I tested were inspired by this work; they were designed and manufactured by **Joachim Morceau** (and his lovely wife), French barista – formerly head Barista at Terres de Café and now owner of the Substance café specialty coffee place in Paris
- Tool principle: before tamping, form **vertical canals** in the coffee puck to create “**controlled channeling**”
- Tool description:
  - 95 steel spikes stuck and glued in a 3D printed base
  - Designed for VST 20g+ baskets
  - 2 versions: 0.8 mm diameter spikes (“thin” Hog) and 1.1 mm diameter spikes
- In the experiments reported in the first section of this document (full flow priority profiles) the hogs were used in combination with a 55 mm diameter paper filter underneath the coffee puck
- The test with 9 bar extractions were performed without paper filter

# THE HOG – IMPACT ON EXTRACTION (1/2)

- **Effects of the hog tool on pressure evolution during espresso extraction (flow profile)**

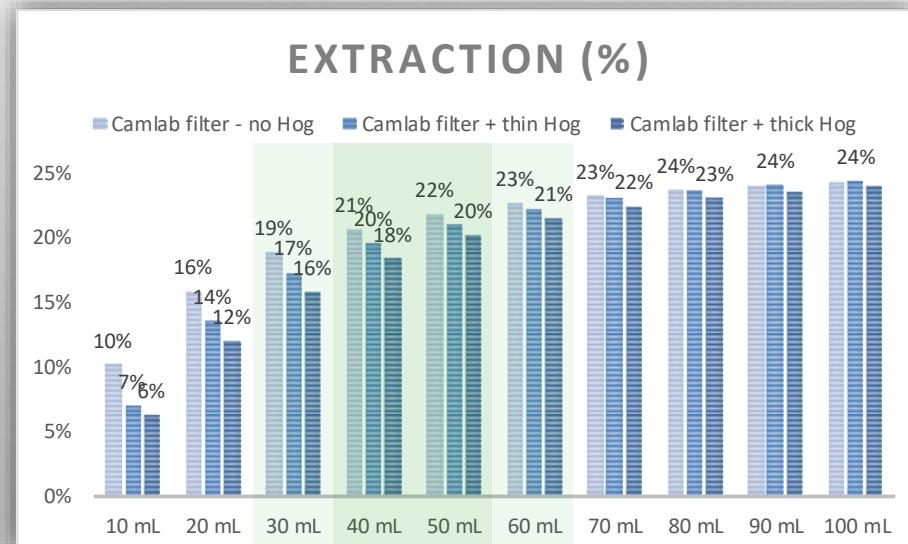
- Grind setting was adapted to reach a comparable pressure peak during extraction
- Much finer grind is needed with the “thick Hog” (EK1.5, from EK2.2 with no hog)
- **Quicker wetting of the coffee puck with hogs, earlier first drop in cup**
- **Slower rates of pressure rise and decrease with hogs – more stable overall extraction pressure**
- Intermediate intensity of all recorded effects with the thinner spines



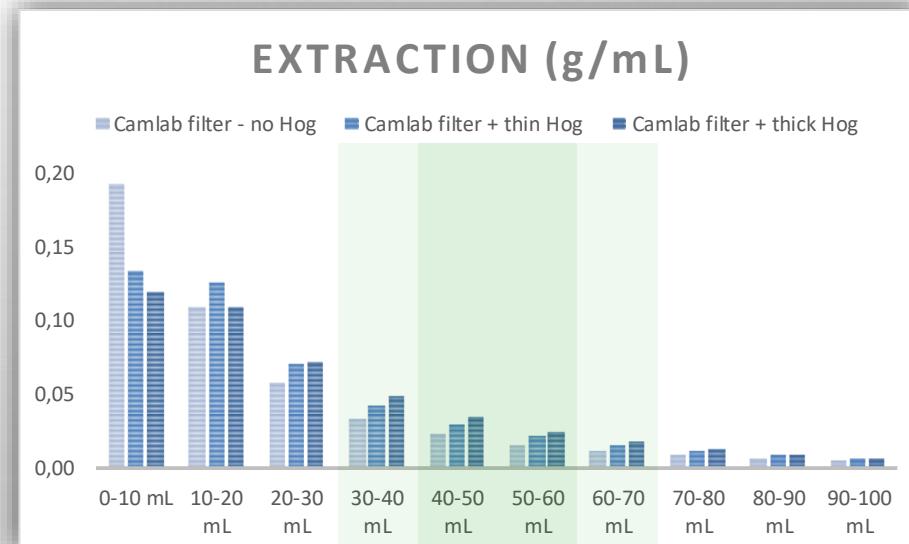
First drop in cup with hogs: 12 s  
Without hog: 14 s

# THE HOG – IMPACT ON EXTRACTION (2/2)

- **Effects of the hog tools on extraction evolution**
  - Flow profile, 19 gram dose
  - For each shot, the output was split into 10 portions (every 4 s after first drop)
  - Thanks to the flow priority extraction (2.5 mL/s) all samples had comparable volumes
  - **Coffee extraction is performed more gradually with the hogs**



Typical brew ratio zone  
(2.1 – 2.6)



# THE HOG – DETAILED TEST PROCEDURE (1/2)

- **Decent Espresso Machine DE1PRO v1.1** with **IMS SI 200 IM** shower screen (i.o. stock IMS CI 200 IM)
- **Mahlkönig EK43 S** grinder
- **Montille water** (Le Mont Dore, France – low mineral content)
- **19g** of **The Barn La Laja** coffee beans (filter roast) ground in a **22g VST basket**  
(roasting date: 16/05/2019 – vacuumed and frozen on 10/06 - Tests made on June 16<sup>th</sup> and 17<sup>th</sup>)
- Beans were ground frozen in a double wall stainless steel cup
- WDT in the cup with a mini whisk
- 55 mm diameter Camlab paper filters below the coffee grinds – no preliminary wetting of the filter
- WDT in the basket with a mini whisk – gentle raking of the puck surface with the hog – no taps
- **Hog tool in and out of the puck**
- Manual tamp with a 58.6 mm tamper
- TDS measurements: Atago PAL zeroed with Montille water – no additional filtering of the coffee samples – dilution (ca. x2) of the 3 first samples from the sliced extractions (to avoid device saturation) – all samples measured at room temperature after thorough agitation – 1 data point = average of 4 to 6 measurements of each coffee sample

# THE HOG – DETAILED TEST PROCEDURE (2/2)

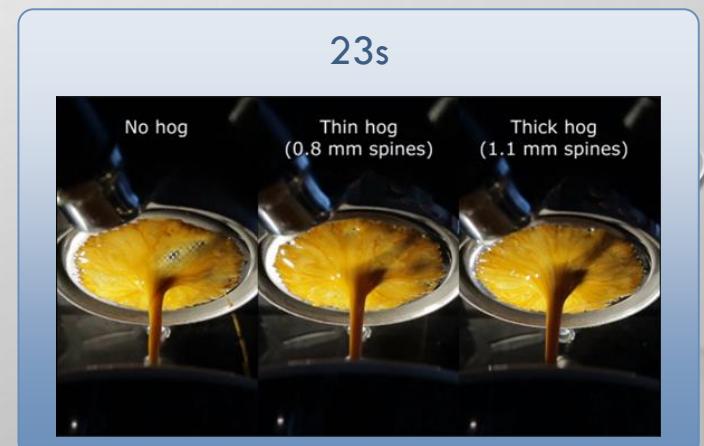
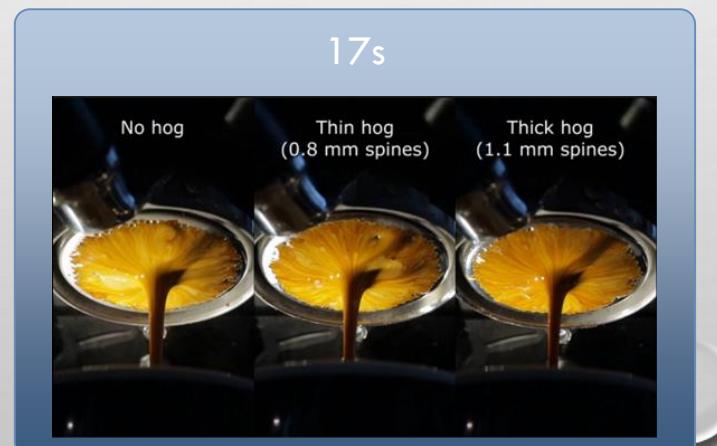
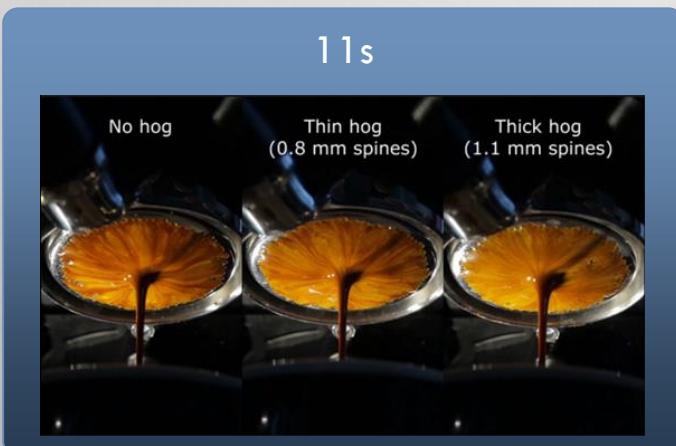
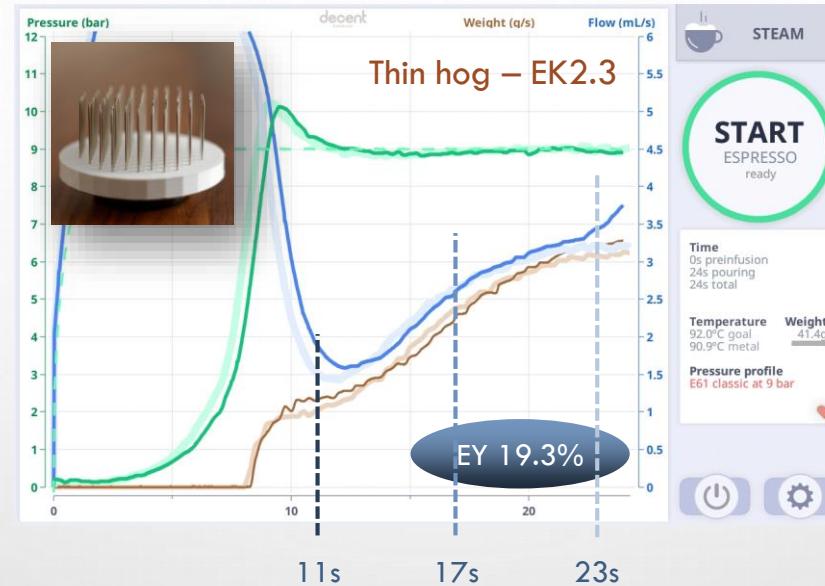
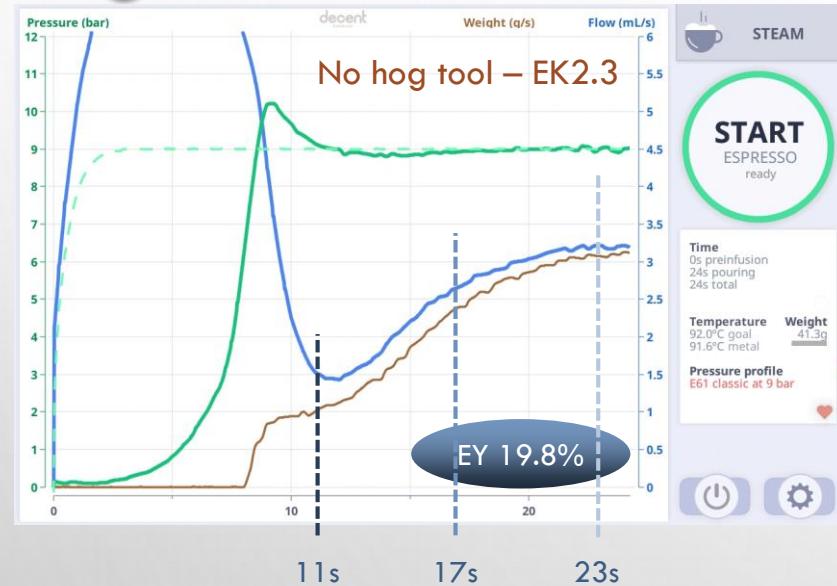
Gemiddelde analyse Montille® Durchschnittsanalyse	
	in / en mg/l
Calcium - Kalzium (Ca <sup>2+</sup> )	4
Magnesium - Magnésium (Mg <sup>2+</sup> )	1
Natrium - Sodium (Na <sup>+</sup> )	3
Kalium - Potassium (K <sup>+</sup> )	0,8
Waterstofcarbonaten - hydrogénocarbonates	
Hydrogénocarbonat (HCO <sub>3</sub> <sup>-</sup> )	23,4
Sulfaten - sulfates - Sulfat (SO <sub>4</sub> <sup>2-</sup> )	0,4
Nitraten -nitrates - Nitrat (NO <sub>3</sub> <sup>-</sup> )	2,1
Silicium - Silice (SiO <sub>2</sub> <sup>-2</sup> )	19
Fluor (F <sup>-</sup> )	<0,1
Chloriden - chlorures - Chlorid (Cl <sup>-</sup> )	0,8
pH	6,7
Droge reststoffen op 180°C	
Résidu sec à 180°C	
Trockensubstanz bei 180°C	
	43,6 mg/l



# TESTS WITH PRESSURE PRIORITY EXTRACTION PROFILES

- “E61 CLASSIC” (STRAIGHT 9 BAR PRESSURE)
- ADVANCED PREINFUSION + 9 BAR PRESSURE
- THESE 2 NEW SETS OF TESTS WERE COMPLETED WITHOUT PAPER FILTER UNDERNEATH THE PUCK

# THE HOG STRAIGHT 9 BAR EXTRACTION



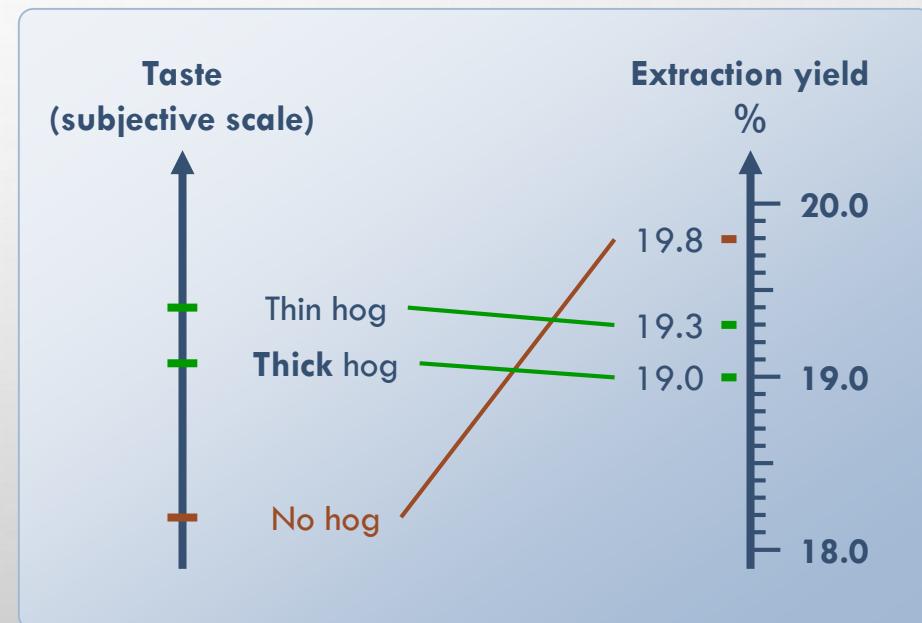
# THE HOG STRAIGHT 9 BAR EXTRACTION

## Observation and measurement results (extraction curves + videos) – with the hog tools:

- Slightly delayed pressure rise but no visible impact on the extraction time
- Altered flow evolution in the cup: higher flow rate first, then lower flow
- Less turbulences and sprays at the exit of the basket
- Lower extraction yield
- All these effects are more intense with the “thick” hog (1.1 mm spines)

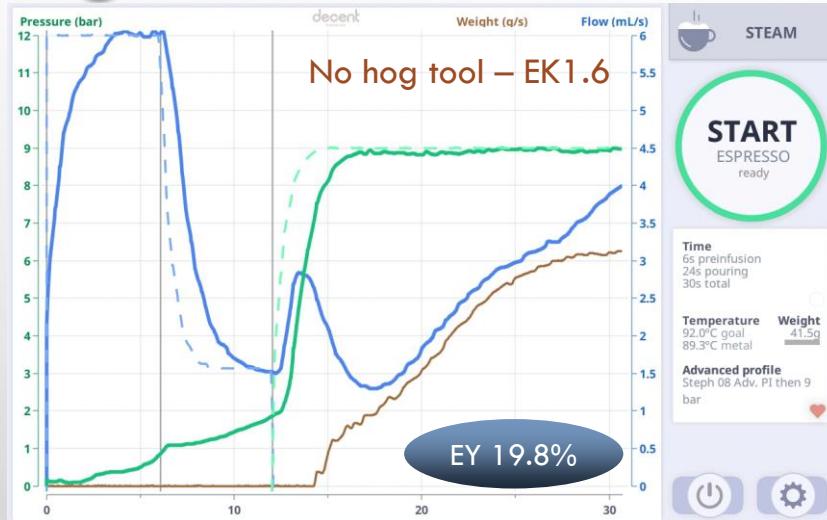
## Taste results

- Very sour taste with no hog (“channeling taste”)
- Better taste with the thick hog (less sour)
- **Significantly improved taste with the thin hog** (much more sweetness)
- Longer extraction time with no hog (not tested) may have led to better taste results (less sour)

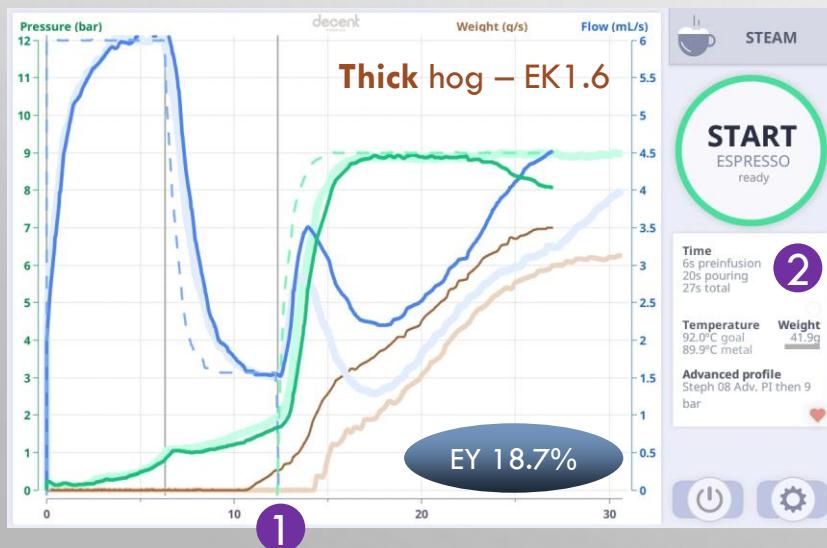


# THE HOG

## ADVANCED PREINFUSION AND 9 BAR EXTRACTION



- 1 Earlier first drop in the cup
- 2 Quicker extraction, especially with the **thin hog** (finer grind needed to compensate)



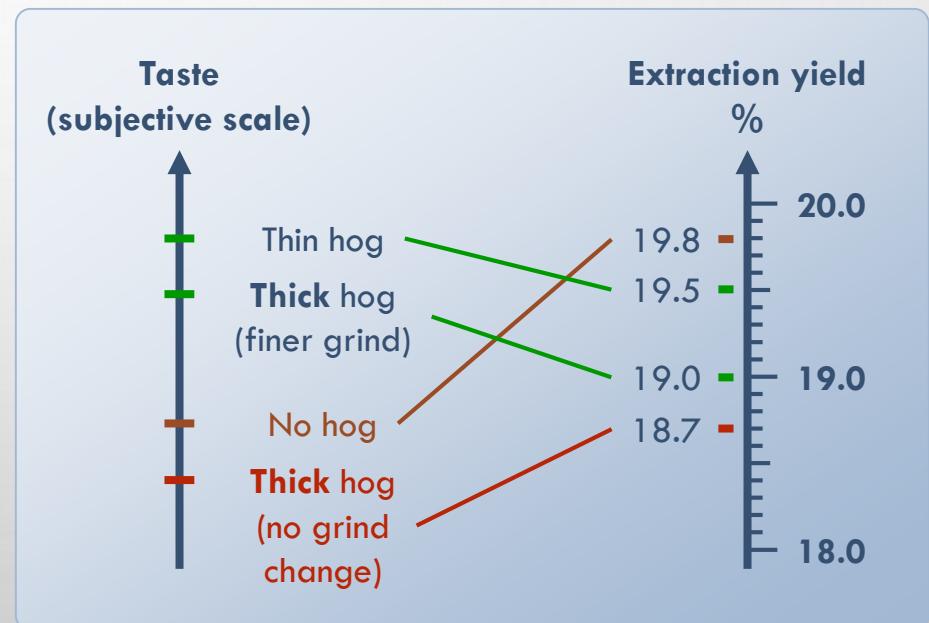
# THE HOG ADVANCED PREINFUSION AND 9 BAR EXTRACTION

## Observation and measurement results (extraction curves + videos) – with the hog tools:

- Earlier first drop in the cup and shorter extraction times
- Lower extraction yield
- All these effects are more intense with the “thick” hog (1.1 mm spines)

## Taste results

- No hog: acceptable balance of acidity, sweetness and astringency – very nice mouthfeel
- Better results with the **thick pins hog** (more sweetness) only after adjustment of the grind setting
- **Significantly improved taste with the thin pins hog** (much more sweetness and fruity taste)



# THE HOG – DETAILED TEST PROCEDURE (TESTS WITH PRESSURE PROFILES)

- Decent Espresso Machine DE1PRO v1.1 with IMS SI 200 IM shower screen (i.o. stock IMS CI 200 IM)
- Mahlkönig EK43 S grinder
- Montille water (Le Mont Dore, France) – adjusted to SCAA with sodium carbonate and Epsom salts

18.5g in a 22g VST basket Target: 42g out	Straight 9 bar profile (July 13 <sup>th</sup> )	Advanced preinfusion and 9 bar extraction (July 14 <sup>th</sup> )
Beans from Friedhats Coffee Roasters	Kochere Boji (natural Yirgacheffe)	Las Margaritas (washed Colombian Pacamara)
Roasting date	01/07/2019	18/06/2019
Vacuumed and frozen	07/07/2019	27/06/2019

- Beans were ground frozen in a double wall stainless steel cup
- WDT in the cup with a mini whisk
- WDT in the basket with a mini whisk – gentle raking of the puck surface with the hog – no taps
- **Hog tool in and out of the puck (hog stand to ensure a straight vertical movement)**
- Manual tamp with a 58.6 mm tamper
- TDS measurements: Atago PAL zeroed with SCAA water – no additional filtering of the coffee samples – all samples measured at room temperature after thorough agitation – 1 data point = average of 3 or 4 measurements of each coffee sample



# THE HOG

## ADVANCED PREINFUSION AND 9 BAR EXTRACTION

**PRESETS** **ADVANCED** **OTHER** **MACHINE**

**Steps**

1. preinfusion step 1  
2. preinfusion step 2  
3. rise and hold to 9 bar

**Insert a step**  
preinfusion step 1

**1: Temperature**  
goal: 92°C  
sensor: coffee

**2: Pump**  
flow: 6.0 mL/s  
pressure: -  
transition: fast

**3: Duration**  
time: 10 seconds

**4: Move on if...**  
pressure is over: 1.0 bar  
pressure is under: -  
flow is over: -  
flow is under: -

**Cancel** **Ok**

**PRESETS** **ADVANCED** **OTHER** **MACHINE**

**Steps**

1. preinfusion step 1  
2. preinfusion step 2  
3. rise and hold to 9 bar

**Insert a step**  
preinfusion step 2

**1: Temperature**  
goal: 92°C  
sensor: coffee

**2: Pump**  
flow: 1.5 mL/s  
pressure: -  
transition: fast

**3: Duration**  
time: 6 seconds

**4: Move on if...**  
pressure is over: -  
pressure is under: -  
flow is over: -  
flow is under: -

**Cancel** **Ok**

**PRESETS** **ADVANCED** **OTHER** **MACHINE**

**Steps**

1. preinfusion step 1  
2. preinfusion step 2  
3. rise and hold to 9 bar

**Insert a step**  
rise and hold to 9 bar

**1: Temperature**  
goal: 92°C  
sensor: coffee

**2: Pump**  
flow: -  
pressure: 9.0 bar  
transition: fast

**3: Duration**  
time: 45 seconds

**4: Move on if...**  
pressure is over: -  
pressure is under: -  
flow is over: -  
flow is under: -

**Cancel** **Ok**