

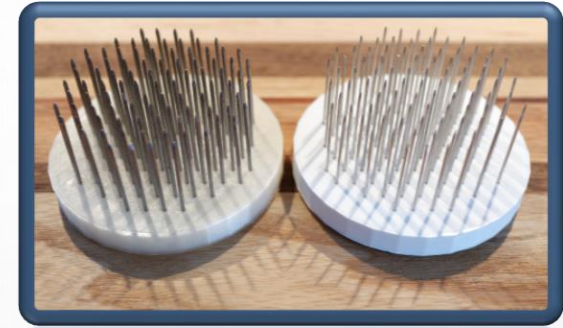
The background of the slide is a light gray gradient, decorated with numerous realistic water droplets of various sizes. Some droplets are large and prominent, while others are small and subtle. They are scattered across the slide, with a higher concentration in the top-left and bottom-right corners.

# 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



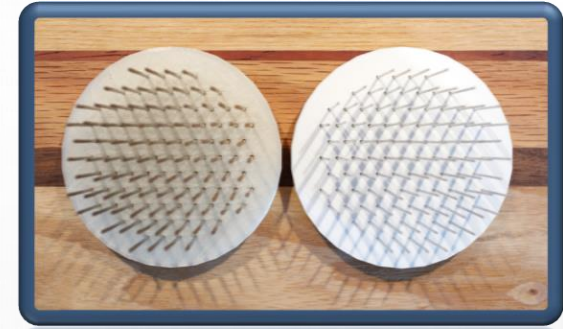
## Benefits

- **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)

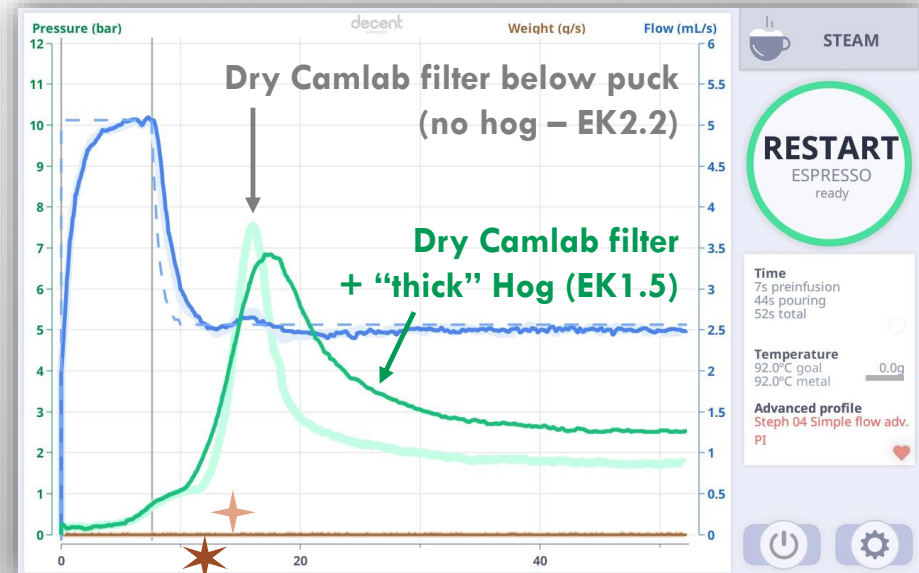
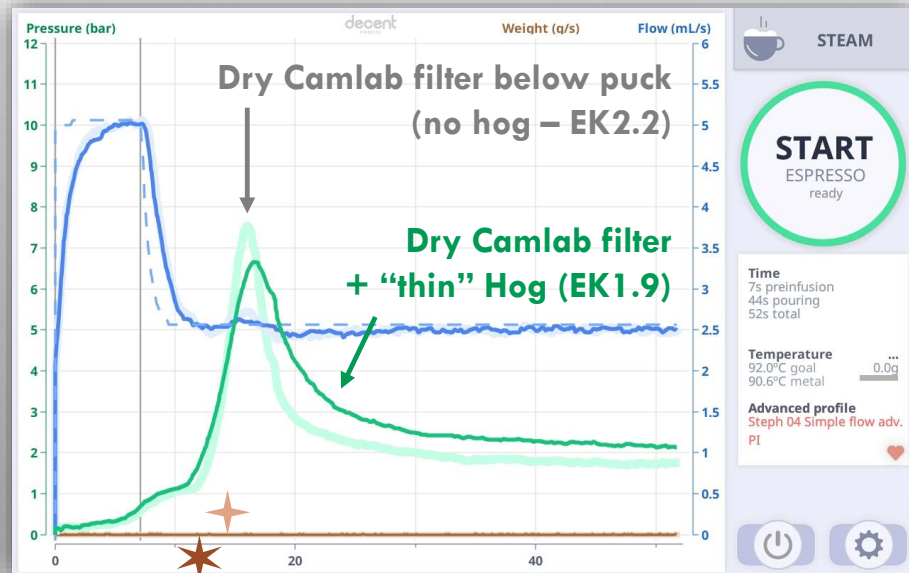
# THE HOG – DESCRIPTION



- 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



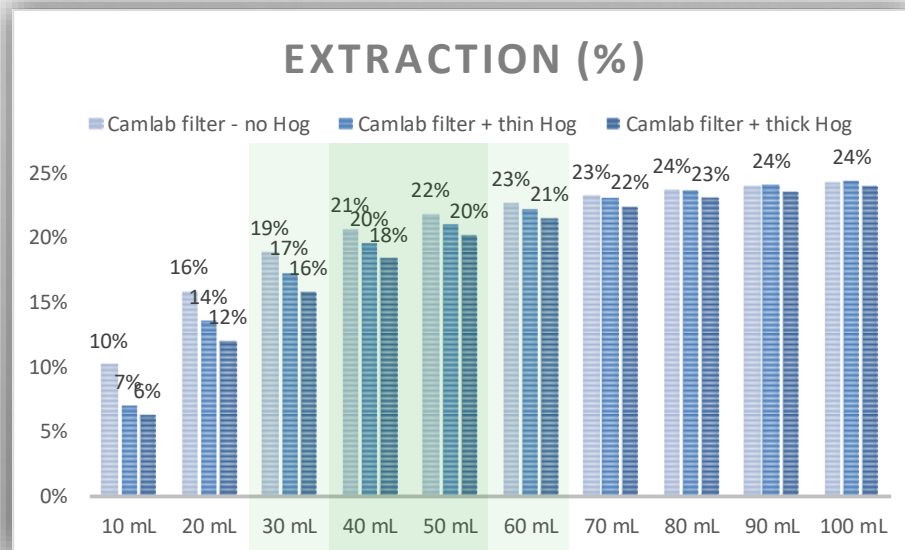
First drop in cup with hogs: 12 s  
Without hog: 14 s



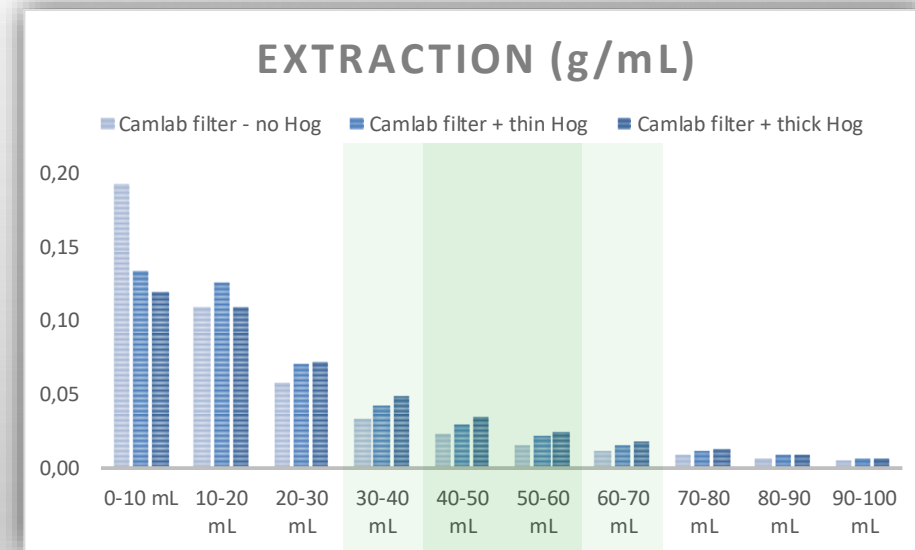
# THE HOG – IMPACT ON EXTRACTION (2/2)

- 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 ( $\text{Ca}^{2+}$ )	4
Magnesium - Magnesium ( $\text{Mg}^{2+}$ )	1
Natrium - Sodium ( $\text{Na}^+$ )	3
Kalium - Potassium ( $\text{K}^+$ )	0,8
Waterstofcarbonaten - hydrogencarbonates Hydrogencarbonat ( $\text{HCO}_3^-$ )	23,4
Sulfaten - sulfates - Sulfat ( $\text{SO}_4^{2-}$ )	0,4
Nitraten - nitrates - Nitrat ( $\text{NO}_3^-$ )	2,1
Silicium - Silice ( $\text{SiO}_2^{2-}$ )	19
Fluor ( $\text{F}^-$ )	<0,1
Chloriden - chlorures - Chlorid ( $\text{Cl}^-$ )	0,8
pH	6,7
Droge reststoffen op 180°C Résidu sec à 180°C Trockensubstanz bei 180°C	
	43,6 mg/l



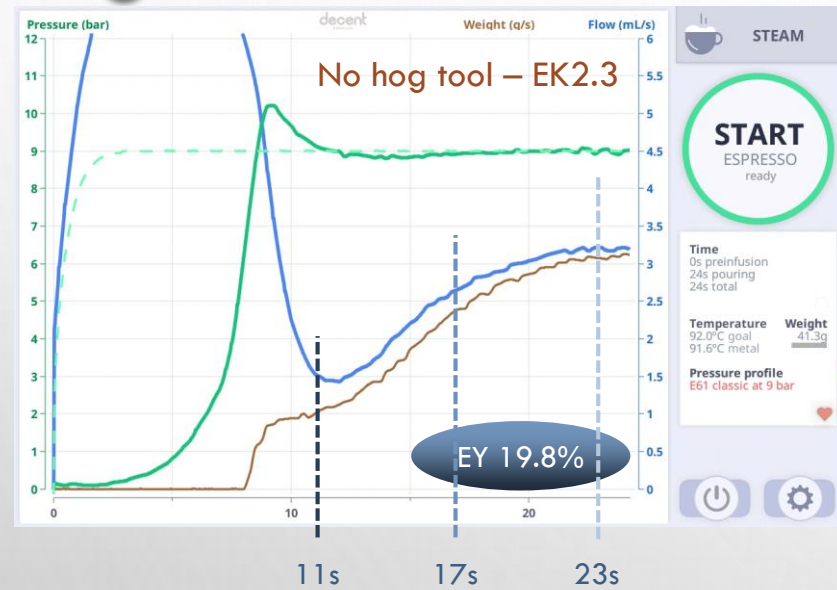
# TESTS WITH PRESSURE PRIORITY EXTRACTION PROFILES

- “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

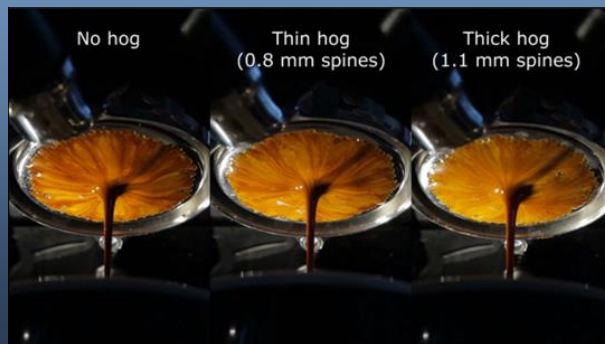


# THE HOG

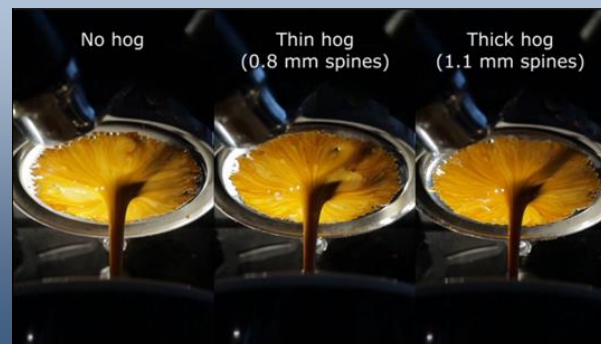
## STRAIGHT 9 BAR EXTRACTION



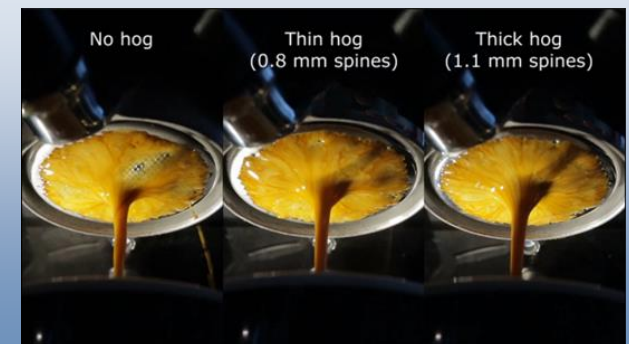
11s



17s



23s



# THE HOG

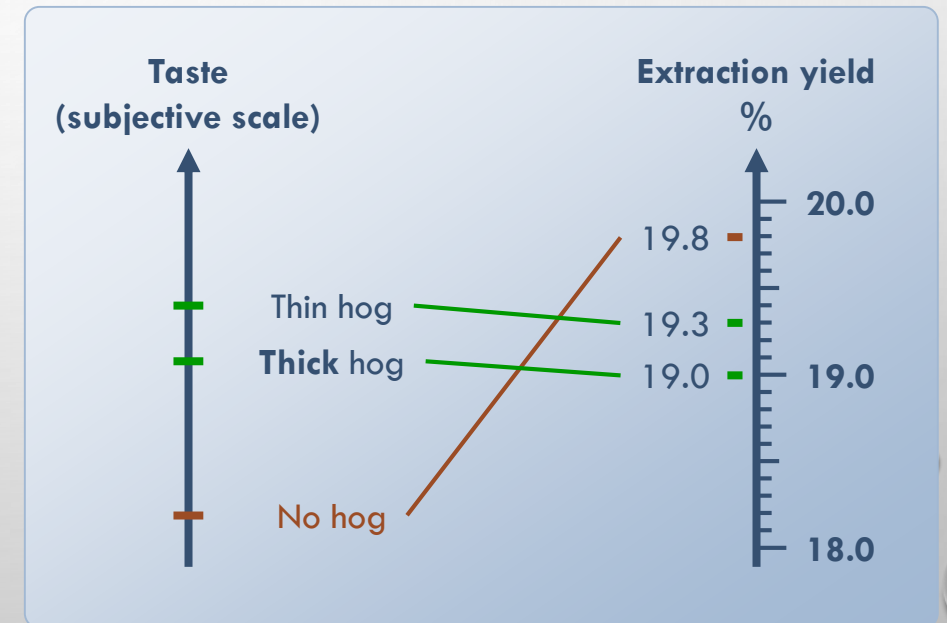
## STRAIGHT 9 BAR EXTRACTION

### 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)

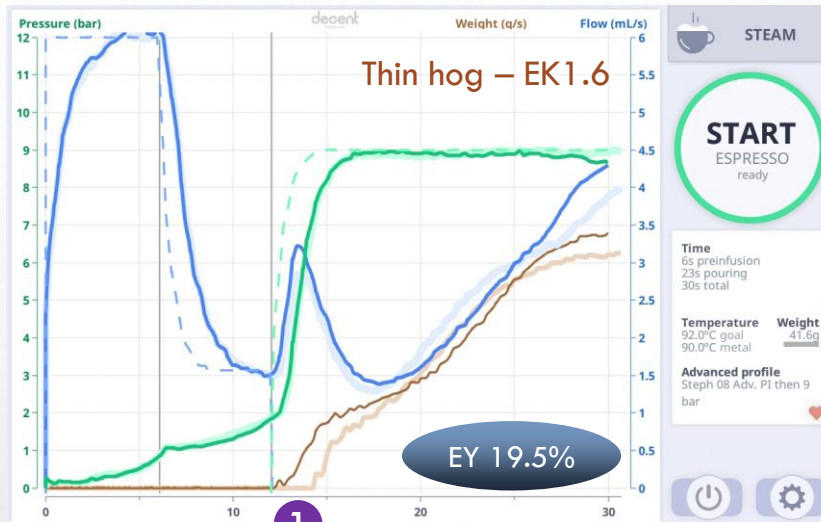
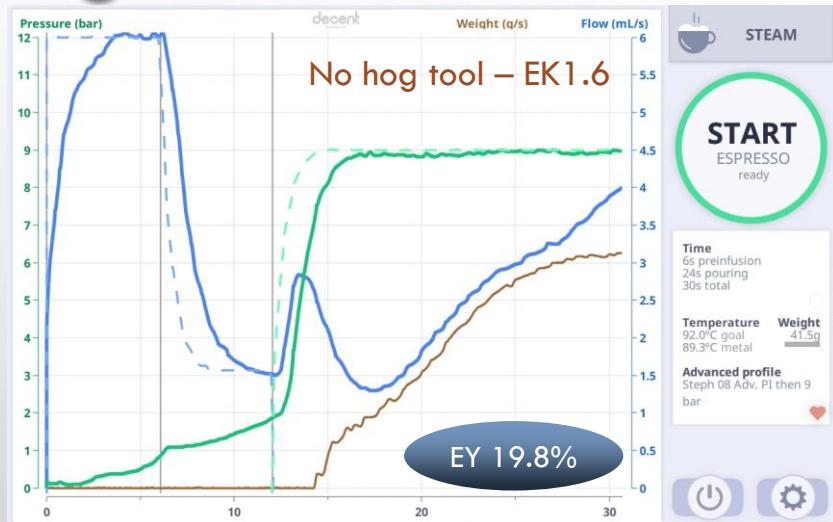
### Taste results

- 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 **thick** hog (finer grind needed to compensate)





# THE HOG

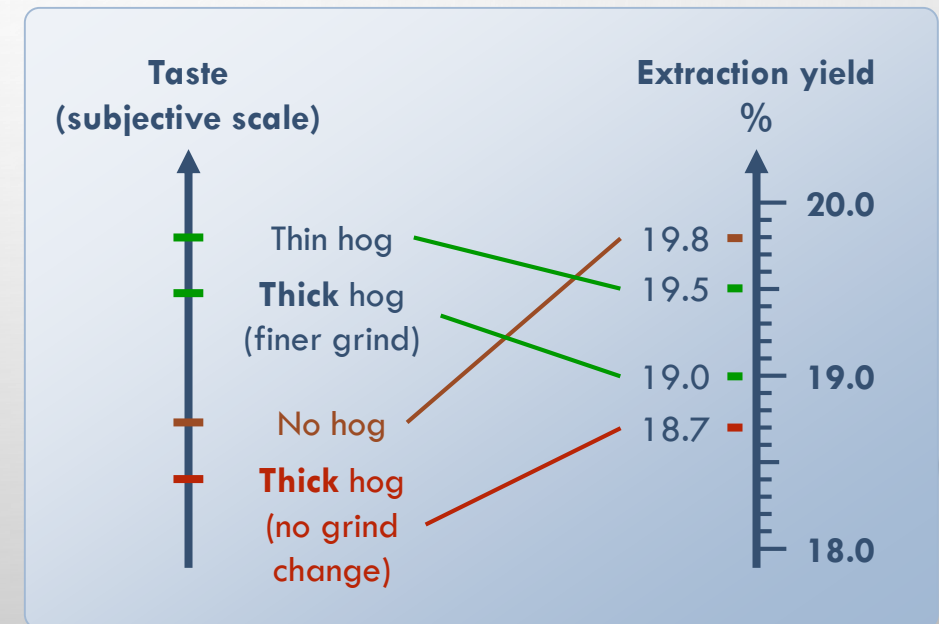
## ADVANCED PREINFUSION AND 9 BAR EXTRACTION

### 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
<b>Steps</b> 1. preinfusion step 1 2. preinfusion step 2 3. rise and hold to 9 bar			
<b>1: Temperature</b> goal: 92°C sensor: coffee			
<b>2: Pump</b> flow: 6.0 mL/s pressure: - transition: fast			
<b>3: Duration</b> time: 10 seconds			
<input checked="" type="checkbox"/> <b>4: Move on if...</b> pressure is over pressure is under flow is over flow is under			
Insert a step preinfusion step 1			
Steps		Limits	
Cancel		Ok	

PRESETS	ADVANCED	OTHER	MACHINE
<b>Steps</b> 1. preinfusion step 1 2. preinfusion step 2 3. rise and hold to 9 bar			
<b>1: Temperature</b> goal: 92°C sensor: coffee			
<b>2: Pump</b> flow: 1.5 mL/s pressure: - transition: fast			
<b>3: Duration</b> time: 6 seconds			
<input type="checkbox"/> <b>4: Move on if...</b> pressure is over pressure is under flow is over flow is under			
Insert a step preinfusion step 2			
Steps		Limits	
Cancel		Ok	

PRESETS	ADVANCED	OTHER	MACHINE
<b>Steps</b> 1. preinfusion step 1 2. preinfusion step 2 3. rise and hold to 9 bar			
<b>1: Temperature</b> goal: 92°C sensor: coffee			
<b>2: Pump</b> flow: - pressure: 9.0 bar transition: fast			
<b>3: Duration</b> time: 45 seconds			
<input type="checkbox"/> <b>4: Move on if...</b> pressure is over pressure is under flow is over flow is under			
Insert a step rise and hold to 9 bar			
Steps		Limits	
Cancel		Ok	