FORGE · PROTOTYPING RESOURCE

FLAVOUR PROTOTYPING TRAINING PROTOCOL

`Customer training aid · Three samples per iteration · 100 mL per sample · Reference flavour: Generic flavour powder`

Manufacturing Health Solutions (MHS) · A prototyping and training exercise — not a confirmation of commercial readiness, shelf-stability, compliance or safety for sale.

FORGE FLAVOUR PROTOTYPING TRAINING PROTOCOL

Method: Three samples per iteration, 100 mL per sample
Reference flavour: Generic flavour powder
Purpose: Customer training aid for brand owners learning how flavour, sweetness and acidity interact before transferring the flavour system into a Forge supplement prototype.

1. PURPOSE AND SCOPE

This protocol teaches brand owners how the main parts of a powdered drink flavour system work together:

- flavour concentration and flavour identity;
- sweetness intensity, timing and aftertaste;
- total acidity and perceived brightness;
- the difference between citric-led and malic-led acidity;
- the interaction between sweetness and acidity;
- the effect of a supplement base on flavour performance.

The learner first tastes a complete reference formulation, then deconstructs it one variable at a time, rebuilds it, compares sweetener systems and finally transfers the selected system into the actual Forge formulation.

> **Important:** This is a prototyping and training exercise. It does not confirm that a formula is commercially finished, shelf-stable, compliant, safe for sale or ready for manufacturing.

2. LEARNING SEQUENCE

STAGE	ACTIVITY	LEARNING OUTCOME
1. Experience	Taste underdeveloped, balanced and overdeveloped examples	Understand what a complete flavour system can taste like
2. Deconstruct	Change flavour, sweetness and total acid separately	Understand the contribution of each component
3. Shape acidity	Compare citric-led, balanced and malic-led acid profiles	Understand acid character versus total acid quantity
4. Rebuild	Prepare softer, reference and more intense versions	Make an independent balance decision
5. Compare sweeteners	Compare Sweetener A, Sweetener B and a blend	Separate sweetness intensity from sweetness quality
6. Transfer	Add the system to the Forge active base	Observe matrix effects and begin product-specific adjustment

WHY THE PROTOCOL STARTS WITH A BALANCED REFERENCE

Many fruit flavours taste incomplete in plain water until sweetness and acidity are present. Starting with a working reference gives the learner a sensory target before they encounter deliberately incomplete samples.

The reference is **a balanced example**, not the only correct answer. A brand owner may ultimately prefer a softer, sharper, sweeter or more intense profile.

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3. FORGE KIT PREMIX SYSTEM

Forge components are diluted so novice users can weigh practical quantities and make controlled adjustments.

All customer worksheets record the **kit premix weight**. Each table also shows the amount and percentage of the **real material** represented by that premix.

3.1 FLAVOUR PREMIX: 10% FLAVOUR

Composition by weight:

- 10% flavour powder;
- 90% maltodextrin;
- equivalent to 1 part flavour and 9 parts maltodextrin.

10% FLAVOUR PREMIX ADDED TO 100 ML	REAL FLAVOUR	PREMIX CONCENTRATION	REAL FLAVOUR CONCENTRATION
0.50 g	0.05 g	0.50% w/v	0.05% w/v
1.00 g	0.10 g	1.00% w/v	0.10% w/v
3.00 g	0.30 g	3.00% w/v	0.30% w/v
4.50 g	0.45 g	4.50% w/v	0.45% w/v

3.2 SWEETENER PREMIX: 10% SWEETENER

Composition by weight:

- 10% sweetener;
- 90% maltodextrin;
- equivalent to 1 part sweetener and 9 parts maltodextrin.

A 10% dilution does **not** make different sweeteners equally sweet. Potency, timing and aftertaste remain specific to each sweetener.

10% SWEETENER PREMIX ADDED TO 100 ML	REAL SWEETENER	PREMIX CONCENTRATION	REAL SWEETENER CONCENTRATION
0.05 g	0.005 g	0.05% w/v	0.005% w/v
0.10 g	0.010 g	0.10% w/v	0.010% w/v
0.15 g	0.015 g	0.15% w/v	0.015% w/v
0.20 g	0.020 g	0.20% w/v	0.020% w/v

3.3 CITRIC AND MALIC ACID PREMIXES: 50% ACID

Each acid premix contains:

- 50% acid;
- 50% maltodextrin;
- equivalent to 1 part acid and 1 part maltodextrin.

Citric and malic acid remain in separate pouches.

50% ACID PREMIX ADDED TO 100 ML	REAL ACID	PREMIX CONCENTRATION	REAL ACID CONCENTRATION
0.05 g	0.025 g	0.05% w/v	0.025% w/v
0.10 g	0.050 g	0.10% w/v	0.050% w/v
0.20 g	0.100 g	0.20% w/v	0.100% w/v
0.30 g	0.150 g	0.30% w/v	0.150% w/v

3.4 PERCENTAGE SHORTCUT FOR 100 ML SAMPLES

In a 100 mL sample, the number of grams added corresponds directly to percent weight/volume.

Examples:

- 3.00 g flavour premix in 100 mL = 3.00% flavour premix;
- because that premix is 10% flavour, it supplies 0.30 g real flavour;
- 0.30 g real flavour in 100 mL = 0.30% real flavour.

> Always distinguish between **premix percentage** and **real-material percentage**.

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4. REFERENCE FORMULATION

The reference is a complete flavour system for **100 mL water**.

4.1 EXACT KIT-COMPONENT MEASUREMENTS

COMPONENT	KIT PREMIX STRENGTH	KIT PREMIX ADDED	REAL MATERIAL SUPPLIED	REAL MATERIAL IN FINISHED 100 ML
flavour premix	10% flavour	**3.00 g**	0.300 g flavour	**0.300% w/v**
Reference sweetener premix	10% sweetener	**0.10 g**	0.010 g sweetener	**0.010% w/v**
Citric acid premix	50% citric acid	**0.20 g**	0.100 g citric acid	**0.100% w/v**
Malic acid premix	50% malic acid	**0.10 g**	0.050 g malic acid	**0.050% w/v**
Water	—	**100 mL**	—	—

4.2 REFERENCE ACTIVE-MATERIAL FORMULA

The reference contains the following real materials as consumed:

REAL MATERIAL	CONCENTRATION IN PREPARED DRINK	EQUIVALENT PER LITRE
flavour powder	**0.300% w/v**	**3.00 g/L**
Sweetener	**0.010% w/v**	**0.10 g/L**
Citric acid	**0.100% w/v**	**1.00 g/L**
Malic acid	**0.050% w/v**	**0.50 g/L**
Total acid	**0.150% w/v**	**1.50 g/L**

The reference acid ratio is:

> Citric : malic = 2 : 1, or approximately 67 : 33.

4.3 HOW THE TRAINING PREMIX CONVERTS TO PRODUCTION

The maltodextrin used to dilute the kit components is a training and handling aid. When the prototype moves into professional production, the production formulation should normally be written using the **real materials**, not the total training-premix weights.

For the reference system:

PRODUCTION BASIS	FLAVOUR	SWEETENER	CITRIC ACID	MALIC ACID
100 mL prepared drink	0.300 g	0.010 g	0.100 g	0.050 g
500 mL prepared drink	1.500 g	0.050 g	0.500 g	0.250 g
1 L prepared drink	3.000 g	0.100 g	1.000 g	0.500 g
100 L prepared drink	300 g	10 g	100 g	50 g

These are **as-consumed beverage concentrations**. For a dry powdered product, the percentage of each ingredient in the finished dry blend depends on the total dry serving weight.

Example: if one dry serving is intended for 500 mL water, include the following real materials per serving before calculating their percentage of the final dry blend:

- flavour: 1.500 g;
- sweetener: 0.050 g;
- citric acid: 0.500 g;
- malic acid: 0.250 g.

To calculate dry-blend percentage:

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ingredient weight per serve ÷ total final dry serve weight × 100
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Final production conversion must be confirmed against the actual flavour specification, sweetener identity, active formula, target serving size and manufacturing process.

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5. EQUIPMENT AND STANDARD CONDITIONS

Use:

- filtered or low-mineral water;
- three identical cups or lidded bottles per iteration;
- a 100 mL measuring cylinder or graduated vessel;

- a scale accurate to at least 0.01 g;
- a 0.001 g scale where very small sweetener changes are required;
- labels or random three-digit sample codes;
- plain water and neutral crackers for palate cleansing;
- a printed or digital tasting worksheet.

STANDARD PREPARATION

1. Measure **100 mL water** into each vessel.
2. Add the exact premix quantities listed for that iteration.
3. Close or cover each vessel and mix each sample in the same way.
4. Allow all samples to rest for five minutes.
5. Taste all samples at the same temperature.
6. Rinse with plain water between samples.
7. Record observations before revealing sample identities.

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6. CORE TESTING RULES

- Every iteration contains exactly three samples.
- During deconstruction, change only one variable at a time.
- Use the balanced reference as the middle sample wherever possible.
- Prepare fresh samples; do not keep adding ingredients to the same cup.
- Randomise tasting order rather than always tasting low to high.
- Record kit-premix weight and real-material percentage.
- Stop when sensory fatigue makes the samples difficult to distinguish.
- Treat the reference as a guide, not a mandatory final formula.

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7. TRAINING PROTOCOL

ITERATION 1 — ORIENTATION TRIAD

OBJECTIVE

Experience the difference between an underdeveloped, balanced and overdeveloped flavour system before analysing individual components.

EXACT FORMULATIONS PER 100 ML

COMPONENT	01 — UNDERDEVELOPED	02 — BALANCED REFERENCE	03 — OVERDEVELOPED
10% flavour premix	**2.10 g**	**3.00 g**	**3.90 g**
10% sweetener premix	**0.07 g**	**0.10 g**	**0.13 g**
50% citric acid premix	**0.14 g**	**0.20 g**	**0.26 g**
50% malic acid premix	**0.07 g**	**0.10 g**	**0.13 g**
Water	100 mL	100 mL	100 mL

REAL-MATERIAL CONCENTRATIONS

REAL MATERIAL	01	02	03
flavour	0.210%	0.300%	0.390%
Sweetener	0.007%	0.010%	0.013%
Citric acid	0.070%	0.100%	0.130%
Malic acid	0.035%	0.050%	0.065%
Total acid	0.105%	0.150%	0.195%

ASSESSMENT

Taste the samples blind and identify:

- which tastes incomplete;
- which appears balanced;
- which is excessive;
- which you would willingly drink as a full serving.

Reveal the reference only after observations have been recorded.

ITERATION 2 — FLAVOUR CONCENTRATION

OBJECTIVE

Learn what flavour concentration does inside a functioning drink system.

Sweetener and acids remain fixed at the reference levels.

EXACT FORMULATIONS PER 100 ML

COMPONENT	F1 — LOW FLAVOUR	F2 — REFERENCE	F3 — HIGH FLAVOUR
10% flavour premix	**1.50 g**	**3.00 g**	**4.50 g**
10% sweetener premix	0.10 g	0.10 g	0.10 g
50% citric acid premix	0.20 g	0.20 g	0.20 g
50% malic acid premix	0.10 g	0.10 g	0.10 g
Water	100 mL	100 mL	100 mL

REAL FLAVOUR CONCENTRATIONS

SAMPLE	REAL FLAVOUR
F1	**0.150% w/v**
F2	**0.300% w/v**
F3	**0.450% w/v**

ASSESSMENT

- How clearly can you identify the flavour?
- Does the low sample feel vague or thin?
- Does the high sample become perfumed, artificial or heavy?
- Does additional flavour improve the drink or only make it stronger?
- Which concentration would you select for a full serving?

ITERATION 3 — SWEETNESS

OBJECTIVE

Learn how sweetness changes flavour recognition, perceived ripeness, acidity and aftertaste.

Flavour and acids remain fixed at the reference levels.

EXACT FORMULATIONS PER 100 ML

COMPONENT	S1 — LOW SWEETNESS	S2 — REFERENCE	S3 — HIGH SWEETNESS
10% flavour premix	3.00 g	3.00 g	3.00 g
10% sweetener premix	**0.05 g**	**0.10 g**	**0.15 g**
50% citric acid premix	0.20 g	0.20 g	0.20 g
50% malic acid premix	0.10 g	0.10 g	0.10 g
Water	100 mL	100 mL	100 mL

REAL SWEETENER CONCENTRATIONS

SAMPLE	REAL SWEETENER
S1	**0.005% w/v**
S2	**0.010% w/v**
S3	**0.015% w/v**

ASSESSMENT

- When does the sweetness appear?
- How strong is the peak?
- How long does it remain?
- Does sweetness make the flavour easier to recognise?
- Does it create bitterness, metallic character, liquorice, cooling or dryness?
- Does the high sample become cloying?

> These exact weights compare one selected 10% sweetener premix. When changing sweetener identity, perceived sweetness may differ substantially even at the same real-material percentage.

ITERATION 4 — TOTAL ACIDITY

OBJECTIVE

Learn how total acid changes brightness, freshness, sourness and perceived sweetness.

Flavour, sweetener and the 2:1 citric-to-malic ratio remain fixed.

EXACT FORMULATIONS PER 100 ML

COMPONENT	A1 — LOW ACID	A2 — REFERENCE	A3 — HIGH ACID
10% flavour premix	3.00 g	3.00 g	3.00 g
10% sweetener premix	0.10 g	0.10 g	0.10 g
50% citric acid premix	**0.10 g**	**0.20 g**	**0.30 g**
50% malic acid premix	**0.05 g**	**0.10 g**	**0.15 g**
Water	100 mL	100 mL	100 mL

REAL ACID CONCENTRATIONS

SAMPLE	CITRIC ACID	MALIC ACID	TOTAL ACTUAL ACID
A1	0.050%	0.025%	**0.075%**
A2	0.100%	0.050%	**0.150%**
A3	0.150%	0.075%	**0.225%**

ASSESSMENT

- Does A1 taste flat or incomplete?
- Does A2 taste bright and complete?
- Does A3 become harsh, thin or tiring?
- How does increasing acid change apparent sweetness?
- Does more acid improve the flavour identity or only increase sourness?

ITERATION 5 — CITRIC-TO-MALIC ACID RATIO

OBJECTIVE

Compare acid shape while holding total actual acid constant.

All three samples contain:

- 0.30 g combined 50% acid premix;
- 0.15 g total actual acid;
- 0.150% actual total acid in the prepared drink.

EXACT FORMULATIONS PER 100 ML

COMPONENT	R1 — CITRIC-LED	R2 — EQUAL RATIO	R3 — MALIC-LED
10% flavour premix	3.00 g	3.00 g	3.00 g
10% sweetener premix	0.10 g	0.10 g	0.10 g
50% citric acid premix	**0.24 g**	**0.15 g**	**0.06 g**
50% malic acid premix	**0.06 g**	**0.15 g**	**0.24 g**
Water	100 mL	100 mL	100 mL

REAL ACID CONCENTRATIONS

SAMPLE	REAL CITRIC ACID	REAL MALIC ACID	ACTUAL ACID RATIO	TOTAL ACTUAL ACID
R1	0.120%	0.030%	80:20	0.150%
R2	0.075%	0.075%	50:50	0.150%
R3	0.030%	0.120%	20:80	0.150%

ASSESSMENT

- Which sample has the strongest initial brightness?
- Which has the longest finish?
- Which makes the flavour most believable?
- Does the malic-led sample linger too long?
- Does the citric-led sample finish too quickly?
- Which ratio best suits the intended product style?

ITERATION 6 — GUIDED RECONSTRUCTION

OBJECTIVE

Use what you have learned to compare a softer profile, the reference profile and a more intense profile.

flavour remains fixed at the reference concentration. Sweetener and total acid move together while the 2:1 citric-to-malic ratio remains fixed.

EXACT FORMULATIONS PER 100 ML

COMPONENT	B1 — SOFTER, 80%	B2 — REFERENCE, 100%	B3 — MORE INTENSE, 120%
10% flavour premix	3.00 g	3.00 g	3.00 g
10% sweetener premix	**0.08 g**	**0.10 g**	**0.12 g**
50% citric acid premix	**0.16 g**	**0.20 g**	**0.24 g**
50% malic acid premix	**0.08 g**	**0.10 g**	**0.12 g**
Water	100 mL	100 mL	100 mL

REAL-MATERIAL CONCENTRATIONS

REAL MATERIAL	B1	B2	B3
flavour	0.300%	0.300%	0.300%
Sweetener	0.008%	0.010%	0.012%
Citric acid	0.080%	0.100%	0.120%
Malic acid	0.040%	0.050%	0.060%
Total acid	0.120%	0.150%	0.180%

ASSESSMENT

- Which sample is easiest to drink?
- Does B1 taste refreshing or incomplete?
- Does B3 taste better or merely stronger?
- Which has the cleanest finish?
- Which best fits the intended product positioning?

If B2 remains preferred, repeat using narrower steps such as 90%, 100% and 110%.

ITERATION 7 — SWEETENER-SYSTEM COMPARISON

OBJECTIVE

Compare sweetness character at the same initial real-material inclusion rate.

This exercise compares equal active inclusion, not guaranteed equal perceived sweetness.

EXACT FORMULATIONS PER 100 ML

COMPONENT	T1 — SWEETENER A	T2 — SWEETENER B	T3 — 50:50 BLEND
10% flavour premix	3.00 g	3.00 g	3.00 g
10% Sweetener A premix	**0.10 g**	0.00 g	**0.05 g**
10% Sweetener B premix	0.00 g	**0.10 g**	**0.05 g**
50% citric acid premix	0.20 g	0.20 g	0.20 g
50% malic acid premix	0.10 g	0.10 g	0.10 g
Water	100 mL	100 mL	100 mL

REAL SWEETENER INCLUSION

SAMPLE	SWEETENER A	SWEETENER B	TOTAL REAL SWEETENER
T1	0.010%	0.000%	0.010%
T2	0.000%	0.010%	0.010%
T3	0.005%	0.005%	0.010%

ASSESSMENT

- Which sweetener has the fastest onset?
- Which has the strongest peak?
- Which remains longest?
- Is there bitterness, metallic character, cooling, dryness or liquorice?
- Which makes the flavour taste most authentic?
- Does the blend improve the finish?

After this equal-inclusion comparison, adjust the preferred sweetener system using a second three-sample round if necessary.

ITERATION 8 — TRANSFER INTO THE FORGE FORMULATION

OBJECTIVE

Determine how the reference flavour system changes when added to the actual supplement base.

EXACT FORMULATIONS PER 100 ML

COMPONENT	P1 — WATER CONTROL	P2 — FORMULA BASELINE	P3 — FLAVOUR-ADJUSTED EXAMPLE
10% flavour premix	**3.00 g**	**3.00 g**	**3.30 g**
10% selected sweetener premix	0.10 g	0.10 g	0.10 g
50% citric acid premix	0.20 g	0.20 g	0.20 g
50% malic acid premix	0.10 g	0.10 g	0.10 g
Forge active base	None	Scaled amount	Same as P2
Water	100 mL	100 mL	100 mL

P3 demonstrates a **10% increase in flavour only**:

- P2 real flavour: 0.300%;
- P3 real flavour: 0.330%.

If the main defect in P2 is not insufficient flavour, use a different one-variable adjustment in P3. Examples:

- sweetener: 0.10 g premix to 0.12 g premix;
- citric acid: 0.20 g premix to 0.24 g premix;
- malic acid: 0.10 g premix to 0.12 g premix;
- reduce one acid component;
- add one defined amount of masking support.

SCALING THE FORGE ACTIVE BASE

If a full active serving is designed for 500 mL, use one-fifth of the full active serving in the 100 mL test.

Example:

- full active serving: 20 g in 500 mL;
- 100 mL training sample: 4 g active base.

ASSESSMENT

- Has the flavour intensity fallen?
- Has sweetness weakened?
- Has bitterness, saltiness, chalkiness or herb character appeared?
- Has the active base buffered the acid?
- Has viscosity reduced aroma release?
- Does the formula require more flavour, more sweetness, a different acid balance or masking support?

> **One-change rule:** Modify only one component in P3 so the effect can be attributed to that change.

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8. THREE-SAMPLE REFINEMENT RULE

After selecting a useful level, place it in the middle and test one sample below and one above it.

Example for flavour:

SAMPLE	10% FLAVOUR PREMIX	REAL FLAVOUR
Low	2.70 g	0.270%
Current	3.00 g	0.300%
High	3.30 g	0.330%

As the preferred range becomes clearer, reduce the step size.

9. SCALING FROM THE 100 ML RESULT

TARGET PREPARED-DRINK VOLUME	MULTIPLY THE 100 ML FORMULA BY
200 mL	2
250 mL	2.5
300 mL	3
500 mL	5
750 mL	7.5
1 L	10

REFERENCE KIT-PREMIX WEIGHTS AT COMMON DRINK VOLUMES

COMPONENT	100 ML	250 ML	500 ML	1 L
10% flavour premix	3.00 g	7.50 g	15.00 g	30.00 g
10% sweetener premix	0.10 g	0.25 g	0.50 g	1.00 g
50% citric acid premix	0.20 g	0.50 g	1.00 g	2.00 g
50% malic acid premix	0.10 g	0.25 g	0.50 g	1.00 g

EQUIVALENT REAL-MATERIAL WEIGHTS

COMPONENT	100 ML	250 ML	500 ML	1 L
Real flavour	0.300 g	0.750 g	1.500 g	3.000 g
Real sweetener	0.010 g	0.025 g	0.050 g	0.100 g
Real citric acid	0.100 g	0.250 g	0.500 g	1.000 g
Real malic acid	0.050 g	0.125 g	0.250 g	0.500 g

10. TASTING SCORECARD

Score each attribute from 0 to 10.

ATTRIBUTE	ASSESSMENT QUESTION	SCORE
Aroma intensity	How strong is the aroma before tasting?	
Flavour identity	How clearly can the flavour be recognised?	
Authenticity	How natural or believable is the flavour?	
Sweetness	How sweet is the sample?	
Sourness	How acidic is the sample?	
Bitterness	How strong is unwanted bitterness?	
Balance	Do flavour, sweetness and acidity work together?	
Body	Does it feel thin, full, chalky or syrupy?	
Aftertaste	How strong and pleasant is the finish?	
Overall preference	Would you drink a complete serving?	

Also record:

- first impression;
- middle;
- finish;
- main defect;
- preferred sample;
- next variable to test.

11. ITERATION WORKSHEET

SAMPLE 1

FIELD	RECORD
Sample code	
Water	100 mL
10% flavour premix	_____ g
Real flavour	_____%
10% Sweetener A premix	_____ g
10% Sweetener B premix	_____ g
Total real sweetener	_____%
50% citric acid premix	_____ g
Real citric acid	_____%
50% malic acid premix	_____ g
Real malic acid	_____%
Forge active base, if used	_____ g
First impression	
Middle	
Finish	
Main defect	
Overall preference / 10	

SAMPLE 2

FIELD	RECORD
Sample code	
Water	100 mL
10% flavour premix	_____ g
Real flavour	_____%
10% Sweetener A premix	_____ g
10% Sweetener B premix	_____ g
Total real sweetener	_____%
50% citric acid premix	_____ g
Real citric acid	_____%
50% malic acid premix	_____ g
Real malic acid	_____%
Forge active base, if used	_____ g
First impression	
Middle	
Finish	
Main defect	
Overall preference / 10	

SAMPLE 3

FIELD	RECORD
Sample code	
Water	100 mL
10% flavour premix	_____ g
Real flavour	_____%
10% Sweetener A premix	_____ g
10% Sweetener B premix	_____ g
Total real sweetener	_____%
50% citric acid premix	_____ g
Real citric acid	_____%
50% malic acid premix	_____ g
Real malic acid	_____%
Forge active base, if used	_____ g
First impression	
Middle	
Finish	
Main defect	
Overall preference / 10	

ITERATION DECISION

QUESTION	RECORD
Preferred sample	
Reason	
Variable tested	
Next variable to test	
Next low / reference / high quantities	

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12. MALTODEXTRIN CARRIER NOTE

The flavour and sweetener premixes contain 90% maltodextrin, and each acid premix contains 50% maltodextrin. Samples containing more premix therefore also contain more carrier.

This can slightly change:

- body;
- total solids;
- perceived acidity;
- finish.

For basic founder training, this is acceptable because the objective is practical learning.

For controlled internal validation, equalise carrier content by adding plain maltodextrin to the lower-premix samples.

The reference 100 mL formula contributes the following training carrier:

SOURCE	PREMIX WEIGHT	MALTODEXTRIN IN PREMIX
flavour premix	3.00 g	2.70 g
Sweetener premix	0.10 g	0.09 g
Citric premix	0.20 g	0.10 g
Malic premix	0.10 g	0.05 g
Total training maltodextrin	—	**2.94 g**

This **2.94 g training maltodextrin per 100 mL is not automatically part of the final commercial flavour system**. During production conversion, MHS should decide whether carrier is required for blending, dose uniformity, flow, flavour delivery or finished-product solids.

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13. EXPECTED OUTCOME

At the end of the protocol, the brand owner should have:

- a selected flavour concentration;
- a selected sweetener system and real-material concentration;
- a preferred total acid concentration;
- a preferred citric-to-malic ratio;
- a documented balanced water formula;
- a clear description of sweetness and aftertaste;
- a comparison between water and the active formulation;
- a list of controlled next adjustments;
- a production-oriented record of real-material quantities;
- a structured prototype brief for professional refinement.

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14. SAFETY AND LIMITATIONS

- Do not taste active ingredients or supplement bases outside their intended prototype quantities.
- Follow all warnings supplied with the relevant Forge kit.
- Do not use this protocol to establish medical, therapeutic or regulatory claims.
- Do not assume that a preferred bench sample is shelf-stable or suitable for commercial production.
- Escalate caffeine, potent sweetener, botanical, allergen and active-dose questions to MHS or an appropriately qualified professional.
- Confirm the exact sweetener identity and supplier specifications before finalising production percentages.
- Confirm the flavour specification and use range against the current supplier documentation before commercial manufacture.

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15. REFERENCE FORMULA SUMMARY

KIT FORMAT PER 100 ML

- 10% flavour premix: **3.00 g**
- 10% sweetener premix: **0.10 g**
- 50% citric acid premix: **0.20 g**
- 50% malic acid premix: **0.10 g**
- water: **100 mL**

REAL-MATERIAL PRODUCTION TARGET AS CONSUMED

- flavour powder: **0.300%**
- sweetener: **0.010%**
- citric acid: **0.100%**
- malic acid: **0.050%**
- total acid: **0.150%**