

**Additional file 2.** Studies on feed with added flavors (intervention) as compared to unflavored feed (control) in animal experiments<sup>1</sup>

Study type	First author Year (Ref.)	Animals in I and C groups	Species	Period of life	Duration of I	Added flavor tested	Feed intake	Body weight gain	Final body weight	Further comments	
1	De Rosa 2002 [41]	Same	Goat	2 to 3 y	6 d within 14 d	Clover, Ryegrass	↑ <sup>a</sup>	n.p.	n.p.	<sup>a</sup> p < 0.001 for ryegrass in two of two sessions; p < 0.05 for clover in one of two sessions	
	Khelil-Arfa 2021 [42]	Same <sup>#</sup>	Pony	4 to 13 y	5 d	Anis, Apple, Caramel, Raspberry	↑ <sup>a</sup>	n.p.	n.p.	<sup>a</sup> p < 0.05 only for apple	
	Harper 2016 [43]	Same <sup>#</sup>	Cattle	Lactation	6 d	Anise, Fenugreek, Honey, Molasses, Orange, Thyme, Vanilla	↔	n.p.	n.p.	Experiment not adequately controlled for strong effect of bin position and C feed not included on each day	
	Seabolt 2010 [44]	Same	Pig	Post-weaning	2 d	Creamy and milky cheese profile with sweet and vanilla bottom notes (Luctarom <sup>®</sup> )	↓ <sup>a</sup>	n.p.	n.p.	<sup>a</sup> p < 0.01	
2	Thomas 2007 [45]	Same <sup>†,#</sup>	Cattle	Calves	21 d (3x7 d)	Orange, Vanilla added to water	↑ <sup>a</sup>	↑ <sup>b</sup>	n.p.	<sup>a</sup> p < 0.05; <sup>b</sup> p < 0.05 only for orange	
		Same <sup>†</sup>		Second-lactation	28 d (4x7 d)	Orange added to water	↔	n.d.	n.p.	-	
	Wene 1982 [46]	Same <sup>†,#</sup>	Baboon	7 to 15 y	48 d	Chocolate, Fruit punch, Lemon, Orange	(↑) <sup>a</sup>	n.d.	n.p.	<sup>a</sup> p = 0.052; The proportion of simple carbohydrates was different between flavored (25 %) and unflavored (5 %) chow which might bias the findings; Unflavored feed was also offered in I period	
		Same <sup>†,#</sup>				48 d	Apple, Lemon, Orange, Sugar	↔	n.d.		n.p.
		Same <sup>†,#</sup>				185 d	Orange, Punch	↑ <sup>a</sup>	n.d.		n.p.
3	Danielsen 1991 [47]	Different	Pig	Pre-weaning	14 d	Cream, Strawberry	↑ <sup>a</sup> , (↑) <sup>b</sup>	↔	↑ <sup>c</sup>	<sup>a</sup> p < 0.05 for cream; <sup>b</sup> p ≤ 0.1 for strawberry; <sup>c</sup> p not given, 0.2 kg higher; <sup>d</sup> p not given,	
				Post-weaning	21 d		↑ <sup>a</sup> , (↑) <sup>b</sup>	↑ <sup>a</sup>	↑ <sup>d</sup>		

			Entire period	35 d		↑ <sup>a</sup> , (↑) <sup>b</sup>	↑ <sup>a,e</sup>	↑ <sup>d</sup>	0.7 kg higher; <sup>e</sup> p < 0.05 for strawberry
Yan 2011 [48]	Different	Pig	Pre-weaning	17 d	Cheese, Vanilla	↑ <sup>a</sup>	↔	n.d.	<sup>a</sup> p < 0.05 only for cheese; <sup>b</sup> p < 0.05
			Post-weaning	7 d		↔	↑ <sup>b</sup>	n.d.	
Wang 2014 [49]	Different	Pig	Pre-weaning	21 d	Fruit-milk, Fruit-milk-anis	↑ <sup>a</sup>	↔	↔	<sup>a</sup> p < 0.05 only for fruit-milk-anis; <sup>b</sup> p < 0.01 only for fruit-milk-anis
			Post-weaning	8 d		↑ <sup>b</sup>	↑ <sup>b</sup>	↔	
Adeleye 2014 [50]	Different <sup>#</sup>	Pig	Pre-weaning	19 d	Apple, Apricot, Butterscotch, Red fruit, Toffee	↑ <sup>a</sup>	n.d.	↔	<sup>a</sup> p = 0.01
			Post-weaning	14 d	-	↔	↑ <sup>a</sup>	(↑) <sup>b</sup>	<sup>a</sup> p = 0.03; <sup>b</sup> p = 0.07
King 1979 [51]	Different	Pig	Pre-weaning	27 d	Firanor	↔	↔	n.d.	<sup>a</sup> p < 0.05 only for piglets receiving flavored starter weaned from sows receiving flavored feed; <sup>b</sup> Same comparison as above, no specific p given but trend described in text
			Post-weaning	31 d		↑ <sup>a</sup>	(↑) <sup>b</sup>	n.d.	
Silva 2018 [52]	Different	Pig	Lactation	24 d	Krave <sup>®</sup> AP in sow feed (2 concentrations)	↑ <sup>a</sup>	↔	↔	<sup>a</sup> p < 0.001
			Pre-weaning			n.d.	↑ <sup>a</sup>	↑ <sup>b</sup>	<sup>a</sup> p < 0.001 only for higher concentration; <sup>b</sup> p < 0.001
Fathi 2009 [53]	Different	Cattle	Pre-weaning	~ 60 d	Vanilla	↑ <sup>a</sup>	↑ <sup>b</sup>	↑ <sup>a</sup>	<sup>a</sup> p = 0.03; <sup>b</sup> p = 0.01; <sup>c</sup> p = 0.02
			Post-weaning	~ 21 d		↔	↔	↑ <sup>c</sup>	
			Entire period	81 d		↑ <sup>c</sup>	↔	↑ <sup>c</sup>	
Thomsen 1980 [54]	Different	Cattle	Pre-weaning	30 d	Butter, Maple , Milk	↔	↑ <sup>a</sup>	n.d.	<sup>a</sup> p < 0.05 only for maple-flavored starter; <sup>b</sup> p < 0.1 only for maple-flavored starter; <sup>c</sup> p < 0.1 only for milk-flavored starter
			Post-weaning	21 d		(↑) <sup>b</sup>	(↑) <sup>b</sup>	n.d.	
			Entire period	51 d		(↑) <sup>b</sup>	↑ <sup>a</sup> , (↑) <sup>c</sup>	n.d.	
Torrallardona 2000 [55]	Different	Pig	Post-weaning	35 d	Luctarom <sup>®</sup> (4 profiles)	↔	↑ <sup>a</sup>	↑ <sup>a</sup>	<sup>a</sup> p = 0.01 all profiles combined compared to C

3	Lv 2012 [56]	Different	Pig	95 d	14 d	Banana, Milk	↔	↑ <sup>a</sup>	↔	<sup>a</sup> p < 0.05
	Dusel 2006 [57]	Different	Cattle	Calves	70 d	CuxArom Toffee Vanilla	↔ <sup>a</sup>	↑ <sup>b</sup>	(↑) <sup>c</sup>	<sup>a</sup> Intake of feed with added flavor only which was restricted from day 43 onwards; <sup>b</sup> p = 0.045; <sup>c</sup> p = 0.078
	Seabolt 2010 [44]	Different	Pig	Post-weaning	35 d	Creamy and milky cheese profile with sweet and vanilla bottom notes (Luctarom <sup>®</sup> )	↔	↔	↔	-
	McLaughlin 1983 [58]	Different	Pig	Post-weaning	35 d	Cheese, Sweet- molasses-caramel	↔	↔	n.d.	-
				Pre-weaning	8 d	Cheese, Commercial flavor, Sweet-molasses- caramel	n.d.	↔	↔	-
				Post-weaning	35 d		↔	↔	n.d.	-
	Sulabo 2010 [59]	Different	Pig	Pre-weaning	4 d	Luctarom <sup>®</sup>	↔	↔	↔	-
				Post-weaning	28 d		↔	↔	↔	-
	Danielsen 1981 [60]	Different	Pig	Pre-weaning	21 d	Suk-aroma	↔	n.d.	↔	-
Post-weaning				35 d	↔		↔	↔	-	
Naim 1985 [61]	Different <sup>#</sup>	Rat	n.d.	23 d	Bacon, Beef, Bread, Cheddar cheese, Cheese paste, Chicken, Chocolate, Liver, Nacho cheese, Peanut, Salami, Vanilla	↔	↔	n.d.	I group was exposed to both flavored and unflavored feed throughout the I period	
Seitz 2020 [62]	Different	Rat	n.d.	21 d	Peppermint	↔	↓ <sup>a</sup>	n.d.	<sup>a</sup> p < 0.05 observed at three different flavor intensities	

<sup>1</sup>Abbreviations used: C, Control; d, Days; I, Intervention; n.d., No data; n.p., Not possible due to study design; y, Years; ↑ indicates significant increase, ↓ significant decrease, ↔ no significant difference of intervention as compared to control, ( ) trend, i.e., p < 0.10 and/or authors describe trend in text; †Intervention and control at different time points with same animals (i.e., within-subject design); #More than one added flavor was fed during one experimental setting to animals in the intervention group; Different animals refers to between-subject design; If a time range for the intervention was given, the shortest period was chosen as duration of intervention; Half days were rounded off; Start and end days of the intervention were counted as full days; Intervention groups with additional sweeteners or without added flavors were excluded from the table.