

FIG. 1A

Table 1		Raw Material			Measurements for Paste Dough Composition						
					Starch		Protein		Insoluble Dietary Fiber		Dry Mass Basis Moisture Content
		Raw Material(s) Used	D ₅₀ after Amylase/Protease and Ultrasonic Treatment (µm)	Average Longest Diameter of CFW -Stained Sites after Amylase/Protease Treatment (µm)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Mass %
Test Example	1	Dried Yellow Pea Starch + Dried Yellow Pea Protein	11	32	Yellow Pea	51.7	Yellow Pea	5.5	Yellow Pea	3.4	50
Test Example	2	Dried Yellow Pea Starch + Dried Yellow Pea Protein	35	84	Yellow Pea	38.5	Yellow Pea	4.1	Yellow Pea	2.6	100
Test Example	3	Dried Yellow Pea Starch + Dried Yellow Pea Protein	25	56	Yellow Pea	51.7	Yellow Pea	5.5	Yellow Pea	3.4	50
Test Example	4	Dried Yellow Pea Starch + Purified Dried Yellow Pea Protein	61	126	Yellow Pea	43.3	Yellow Pea	13.4	Yellow Pea	8.3	30
Test Example	5	Dried Yellow Pea Starch + Pea Protein	168	322	Yellow Pea	35.7	Yellow Pea	21.4	Yellow Pea	4.6	50
Test Example	6	Dried Yellow Pea Starch + Dried Yellow Pea Protein	185	423	Yellow Pea	13.9	Pea	48.6	Yellow Pea	4.2	50
Test Example	7	Dried Yellow Pea Starch + Dried Yellow Pea Protein	68	150	Yellow Pea	10.8	Pea	59.0	Yellow Pea	4.2	50
Test Example	8	Dried Yellow Pea Flour (d90 < 250µm, Pin Mill) + Dried Yellow Pea Protein	195	262	Yellow Pea	20.8	Yellow Pea, Pea	34.7	Yellow Pea	4.2	50
Test Example	9	Dried Yellow Pea Flour (d90 < 250µm, Pin Mill) + Dried Yellow Pea Protein	219	368	Yellow Pea	17.4	Yellow Pea, Pea	41.7	Yellow Pea	4.2	50
Test Example	10	Dried Yellow Pea Starch + Soybean Protein	65	121	Yellow Pea	35.7	Soybean	17.9	Yellow Pea, Soybean	3.6	50
Test Example	11	Dried Yellow Pea Starch + Pumpkin Seed Protein	416	n.a.	Yellow Pea	35.7	Pumpkin Seed	12.9	Yellow Pea, Pumpkin Seed	21.8	50
Test Example	12	Dried Yellow Pea Starch + Hemp Seed Protein	360	n.a.	Yellow Pea	39.3	Hemp Seed	14.3	Yellow Pea, Hemp Seed	27.9	50
Test Example	13	Mung Bean Starch + Dried Yellow Pea Protein	84	261	Mung Bean	52.0	Yellow Pea	11.2	Mung Bean, Yellow Pea	4.0	30
Test Example	14	Mung Bean Starch + Pea Protein	198	326	Mung Bean	34.7	Pea	13.9	Pea	4.2	50
Test Example	15	Mung Bean Starch + Purified Soybean Protein	165	268	Mung Bean	38.2	Soybean	15.6	Mung Bean	4.2	50
Test Example	16	Mung Bean Starch + Purified Soybean Protein	166	351	Mung Bean	56.0	Soybean	8.0	Mung Bean	4.0	30
Test Example	17	Mung Bean Starch + Hemp Protein	166	230	Mung Bean	38.2	Hemp Seed	10.4	Mung Bean , Hemp Seed	4.2	50
Test Example	18	Mung Bean Starch + Purified Wheat Protein	166	169	Mung Bean	38.2	Wheat	13.5	Mung Bean	4.2	50

FIG. 1B

Table 1		Raw Material			Measurements for Paste Dough Composition						
					Starch		Protein		Insoluble Dietary Fiber		Dry Mass Basis Moisture Content
		Raw Material(s) Used	D ₅₀ after Amylase/Protease and Ultrasonic Treatment (μm)	Average Longest Diameter of CFW -Stained Sites after Amylase/Protease Treatment (μm)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Mass %
Test Example	19	Potato Starch + Pea Protein	300	430	Potato	35.7	Yellow Pea	21.4	Potato	1.6	50
Test Example	20	Potato Starch + Purified Soybean Protein	326	368	Potato	38.2	Soybean	17.4	Soybean	4.2	50
Test Example	21	Potato Starch + Dried Yellow Pea Protein	336	433	Mung Bean	64.0	Yellow Pea	4.8	Yellow Pea	4.0	30
Test Example	22	Potato Starch + Hemp Seed Protein	428	536	Potato	60.0	Hemp Seed	4.4	Hemp Seed	4.0	30
Test Example	23	Wheat Starch + Dried Yellow Pea Protein	16	31	Wheat	64.0	Yellow Pea	5.4	Yellow Pea	4.0	30
Test Example	24	Wheat Starch + Pumpkin Seed Protein	280	369	Wheat	56.0	Pumpkin Seed	5.3	Pumpkin Seed	4.0	30
Test Example	25	Wheat Starch + Purified Pea Protein	350	450	Wheat	32.1	Pea	21.4	Pea	1.4	50
Test Example	26	Wheat Starch + Purified Soybean Protein	350	490	Wheat	38.2	Soybean	15.1	Soybean	4.2	50
Test Example	27	Wheat Starch + Hemp Protein	450	560	Wheat	39.3	Hemp Seed	10.7	Hemp Seed	3.6	50
Test Example	28	Corn Starch + Pea Protein	25	51	Corn	64.0	Pea	5.3	Corn, Pea	4.0	30
Test Example	29	Corn Starch + Wheat Protein	23	32	Corn	56.0	Wheat	7.5	Corn , Wheat	4.0	30
Test Example	30	Dried Lentil Flour (d90 < 500μm, Stone Mill)	440	498	Lentil	29.0	Lentil	18.5	Lentil	2.5	50
Test Example	31	Dried Black Kidney Bean Flour (d90 < 400μm, Stone Mill)	369	489	Black Kidney Bean	15.9	Black Kidney Bean	31.4	Black Kidney Bean	13.8	50
Test Example	32	Dried Chickpea Flour (d90 < 200μm, Pin Mill)	145	262	Chickpea	35.5	Chickpea	11.0	Chickpea	16.1	60
Test Example	33	Dried Mung Bean Flour (d90 < 150μm, Airflow Mill)	103	165	Mung Bean	27.5	Mung Bean	17.3	Mung Bean	9.7	50
Test Example	34	Dried White Pea Flour (d90 < 250μm, Pin Mill)	156	321	White Pea	37.9	White Pea	15.0	White Pea	11.2	50
Test Example	35	Semi-Hard Wheat Flour + Dried Yellow Pea Flour (d90 < 250μm, Pin Mill)	156	256	Wheat, Yellow Pea	42.2	Wheat, Yellow Pea	12.2	Wheat, Yellow Pea	3.2	50
Test Example	36	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	35	65	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60

FIG. 1C

Table 1		Raw Material			Measurements for Paste Dough Composition						
					Starch		Protein		Insoluble Dietary Fiber		Dry Mass Basis Moisture Content
		Raw Material(s) Used	D ₅₀ after Amylase/Protease and Ultrasonic Treatment (µm)	Average Longest Diameter of CFV -Stained Sites after Amylase/Protease Treatment (µm)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Mass %
Test Example	37	Dried Yellow Pea Flour (d90 < 250µm, Airflow) -> Treated at Dry Mass Basis Moisture Content 50%, Highest Temperature 120°C, SME 900 kJ/kg, then Cut into 1cm ³ Chips -> Dried until Dry Mass Basis Moisture Content Reached 10%, then Re-Crushed (d90 < 50µm, Pin Mill)	132	145	Yellow Pea	35.2	Yellow Pea	13.8	Yellow Pea	5.6	50
Test Example	38	Dried Yellow Pea Crushed at Dry Mass Basis Moisture Content 5%, Highest Temperature 80°C (d90 < 250µm, Stone Mill)	161	232	Yellow Pea	35.2	Yellow Pea	13.8	Yellow Pea	5.6	50
Test Example	39	Dried Yellow Pea Flour (d90 < 250µm, Pin Mill)	100	168	Yellow Pea	50.2	Yellow Pea	17.7	Yellow Pea	7.5	50
Test Example	40	Dried Yellow Pea Flour (d90 < 250µm, Pin Mill)	146	262	Yellow Pea	34.6	Yellow Pea	12.2	Yellow Pea	5.2	50
Test Example	41	Dried Yellow Pea Flour (d90 < 50µm, Jet Mill)	15	22	Yellow Pea	44.0	Yellow Pea	13.6	Yellow Pea	20.0	30
Test Example	42	Dried Yellow Pea Flour (d90 < 250µm, Pin Mill)	136	213	Yellow Pea	31.4	Yellow Pea	9.7	Yellow Pea	14.3	80
Test Example	43	Dried Yellow Pea Flour (d90 < 250µm, Pin Mill)	123	143	Yellow Pea	35.5	Yellow Pea	11.0	Yellow Pea	16.1	60
Test Example	44	Dried Yellow Pea Flour (with Seed Skins) (d90 < 250µm, Pin Mill)	150	168	Yellow Pea	35.5	Yellow Pea	11.0	Yellow Pea	16.1	60
Test Example	45	Dried Yellow Pea Flour (d90 < 50µm, Pin Mill)	30	45	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	46	Dried Yellow Pea Flour (d90 < 50µm, Pin Mill)	30	55	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	47	Dried Yellow Pea Flour (with Seed Skins) (d90 < 50µm, Pin Mill)	35	46	Yellow Pea	34.6	Yellow Pea	16.1	Yellow Pea	5.2	50
Test Example	48	Dried Yellow Pea Flour (with Seed Skins) (d90 < 250µm, Pin Mill)	210	365	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	49	Dried Yellow Pea Flour (d90 < 50µm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	50	Dried Yellow Pea Flour (d90 < 50µm, Pin Mill)	46	55	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	51	Dried Yellow Pea Flour (d90 < 50µm, Pin Mill)	24	36	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	52	Dried Yellow Pea Flour (d90 < 120µm, Pin Mill)	85	116	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	53	Dried Yellow Pea Flour (d90 < 250µm, Pin Mill)	192	216	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60

FIG. 1D

Table 1		Raw Material			Measurements for Paste Dough Composition						
					Starch		Protein		Insoluble Dietary Fiber		Dry Mass Basis Moisture Content
		Raw Material(s) Used	D ₅₀ after Amylase/Protease and Ultrasonic Treatment (μm)	Average Longest Diameter of CFW -Stained Sites after Amylase/Protease Treatment (μm)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Mass %
Test Example	54	Dried Yellow Pea Flour (with Seed Skins) (d90 < 350μm, Pin Mill)	315	415	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	55	Dried Yellow Pea Flour (with Seed Skins) (d90 < 50μm, Pin Mill)	40	68	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	56	Dried Yellow Pea Flour (with Seed Skins) (d90 < 50μm, Pin Mill)	40	79	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	57	Dried Yellow Pea Flour (with Seed Skins) (d90 < 50μm, Pin Mill)	40	89	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	58	Dried Yellow Pea Flour (with Seed Skins) (d90 < 50μm, Pin Mill)	40	51	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	59	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	35	43	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	60	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	35	45	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Test Example	61	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	30
Test Example	62	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	45
Test Example	63	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	75
Test Example	64	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	125
Test Example	65	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	175
Comparative Example	1	Dried Yellow Pea Starch	12	15	Yellow Pea	62.5	-	0.0	Yellow Pea	0.0	50
Comparative Example	2	Dried Yellow Pea Starch + Purified Pea Protein	58	69	Yellow Pea	57.1	Yellow Pea	3.6	Yellow Pea	4.6	50
Comparative Example	3	Dried Yellow Pea Flour (d90 < 250μm, Pin Mill) + Dried Yellow Pea Protein	238	258	Yellow Pea	9.0	Yellow Pea, Pea	52.1	Yellow Pea	4.2	50
Comparative Example	4	Dried Yellow Pea-Derived Starch + Purified Whey Protein	15	20	Yellow Pea	49.1	Whey	24.4	Yellow Pea	4.1	50
Comparative Example	5	Mung Bean Starch + Purified Whey Protein	8	9	Mung Bean	38.2	Whey	17.3	Mung Bean	4.2	50

FIG. 1E

Table 1		Raw Material			Measurements for Paste Dough Composition						
					Starch		Protein		Insoluble Dietary Fiber		Dry Mass Basis Moisture Content
		Raw Material(s) Used	D ₅₀ after Amylase/Protease and Ultrasonic Treatment (μm)	Average Longest Diameter of CFW -Stained Sites after Amylase/Protease Treatment (μm)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Origin (Main Raw Material)	Mass % (Wet Mass Basis)	Mass %
Comparative Example	6	Commercial Product: Spaghetti	N.A.	N.A.	Wheat	N.A.	Wheat	N.A.	Wheat	N.A.	N.A.
Comparative Example	7	Commercial Product: Mung Bean Harusame			Mung Bean		Mung Bean		Mung Bean		
Comparative Example	8	Commercial Product: Udon			Wheat		Wheat		Wheat		
Comparative Example	9	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	46	69	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Comparative Example	10	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	36	56	Yellow Pea	34.6	Yellow Pea	16.1	Yellow Pea	5.2	50
Comparative Example	11	Dried Yellow Pea Flour (with Seed Skins) (d90 < 250μm, Pin Mill)	241	295	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Comparative Example	12	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	22	35	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Comparative Example	13	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	32	35	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Comparative Example	14	Dried Yellow Pea Flour (d50=約500μm, Pin Mill)	672	756	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Comparative Example	15	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	10
Comparative Example	16	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	24	32	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	20
Referential Example	1	Dried Yellow Pea Starch + Dried Yellow Pea Protein	16	23	Yellow Pea	51.7	Yellow Pea	5.5	Yellow Pea	3.4	50
Referential Example	2	Dried Yellow Pea Flour (d90 < 250μm, Airflow) -> Treated at Dry Mass Basis Moisture Content 50%, Highest Temperature 150°C, SME 300kJ/kg -> Dried until Dry Mass Basis Moisture Content Reaches 10%, then Crushed (d90 < 250μm, Pin Mill)	151	265	Pea	38.3	Pea	9.8	Pea	4.2	40
Referential Example	3	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	12	35	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Referential Example	4	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	16	26	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Referential Example	5	Dried Yellow Pea Flour (d90 < 250μm, Pin Mill)	261	369	Yellow Pea	34.6	Yellow Pea	16.1	Yellow Pea	5.2	50
Referential Example	6	Dried Yellow Pea Flour (with Seed Skins) (d90 < 250μm, Pin Mill)	215	452	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60
Referential Example	7	Dried Yellow Pea Flour (d90 < 50μm, Pin Mill)	26	42	Yellow Pea	32.4	Yellow Pea	11.4	Yellow Pea	3.2	60

FIG. 2A

Table 2		Processing Conditions															Post-Treatment		
		Equipment used				Temperature Conditions for Each Barrel Part									Barrel Rotation Speed	Kneading Strength (SME)	Internal Pressure (Outlet Pressure)	Drying Conditions	Retention Time with Dry Basis Moisture Content of ≥ 25 Mass %
		Equipment Type	Ratio of Flight Screw Part	Kneading Part	Water Injection Method	(1) (Inlet Temp.)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (Outlet Temp.)					
						°C	°C	°C	°C	°C	°C	°C	°C	°C	rpm	kJ/kg	MPa		Hour
Test Example	1	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	After immersion in water, dried at normal temperature	12
Test Example	2	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	12
Test Example	3	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	100	100	100	100	100	80	325	1004	6.3	Dried at normal temperature	1
Test Example	4	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	502	0.5	Dried with airflow	0.1
Test Example	5	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	656	6.6	Dried at normal temperature	1
Test Example	6	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	7	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	8	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	772	6.6	Dried at normal temperature	1
Test Example	9	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	10	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	11	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	12	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	13	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Test Example	14	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	463	6.6	Dried at normal temperature	1
Test Example	15	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1

FIG. 2B

Table 2		Processing Conditions															Post-Treatment		
		Equipment used				Temperature Conditions for Each Barrel Part									Barrel Rotation Speed	Kneading Strength (SME)	Internal Pressure (Outlet Pressure)	Drying Conditions	Retention Time with Dry Basis Moisture Content of ≥ 25 Mass %
		Equipment Type	Ratio of Flight Screw Part	Kneading Part	Water Injection Method	(1) (Inlet Temp.)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (Outlet Temp.)					
						°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	rpm	kJ/kg	MPa	
Test Example	16	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Test Example	17	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	18	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	19	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	20	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	618	6.6	Dried at normal temperature	1
Test Example	21	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Test Example	22	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Test Example	23	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	558	6.5	Dried at normal temperature	1
Test Example	24	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Test Example	25	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	26	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	27	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	28	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Test Example	29	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Test Example	30	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	656	0.5	Dried with airflow	0.5

FIG. 2C

Table 2		Processing Conditions															Post-Treatment		
		Equipment used				Temperature Conditions for Each Barrel Part									Barrel Rotation Speed	Kneading Strength (SME)	Internal Pressure (Outlet Pressure)	Drying Conditions	Retention Time with Dry Basis Moisture Content of ≥ 25 Mass %
		Equipment Type	Ratio of Flight Screw Part	Kneading Part	Water Injection Method	(1) (Inlet Temp.)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (Outlet Temp.)					
							%			°C	°C	°C	°C	°C	°C	°C	°C	°C	rpm
Test Example	31	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	734	0.5	Dried with airflow	0.3
Test Example	32	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	33	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	34	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	35	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	36	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	100	100	120	120	95	80	325	618	2.5	Dried at normal temperature	1
Test Example	37	Uniaxia Extruder	40	(4), (5), (6), (7)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	100	540	3.4	Dried at normal temperature	1
Test Example	38	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	39	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	None	—
Test Example	40	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	541	0.5	Dried at normal temperature	2
Test Example	41	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	42	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	3
Test Example	43	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	2
Test Example	44	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	40	325	927	6.6	Dried at normal temperature	12
Test Example	45	Biaxial Extruder	100	—	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	772	6.6	Dried at normal temperature	1

FIG. 2D

Table 2		Processing Conditions															Post-Treatment		
		Equipment used				Temperature Conditions for Each Barrel Part									Barrel Rotation Speed	Kneading Strength (SME)	Internal Pressure (Outlet Pressure)	Drying Conditions	Retention Time with Dry Basis Moisture Content of ≥ 25 Mass %
		Equipment Type	Ratio of Flight Screw Part	Kneading Part	Water Injection Method	(1) (Inlet Temp.)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (Outlet Temp.)					
							%			°C	°C	°C	°C	°C	°C	°C	°C	°C	rpm
Test Example	46	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	47	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	1081	10.4	Dried at normal temperature	1
Test Example	48	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Test Example	49	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	502	0.3	Dried at normal temperature	2
Test Example	50	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	140	140	140	140	95	80	325	849	5.4	Dried at normal temperature	1
Test Example	51	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	160	160	160	160	95	80	325	965	7.0	Dried at normal temperature	1
Test Example	52	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	849	6.5	Dried at normal temperature	1
Test Example	53	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	849	6.5	Dried at normal temperature	1
Test Example	54	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	849	6.5	Dried at normal temperature	1
Test Example	55	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	55	325	965	10	Dried at normal temperature	5
Test Example	56	Uniaxia Extruder	40	(4), (5), (6), (7)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	100	350	3.4	Dried at normal temperature	1
Test Example	57	Uniaxia Extruder	40	(4), (5), (6), (7)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	100	540	3.4	After immersion in water, dried at normal temperature	10
Test Example	58	Uniaxia Extruder	40	(4), (5), (6), (7)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	100	410	3.4	Dried at normal temperature	1
Test Example	59	Uniaxia Extruder	40	(4), (5), (6), (7)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	100	380	3.4	Dried at normal temperature	1
Test Example	60	Uniaxia Extruder	40	(4), (5), (6), (7)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	100	390	3.4	Dried at normal temperature	1

FIG. 2B

Table 2		Processing Conditions															Post-Treatment		
		Equipment used				Temperature Conditions for Each Barrel Part									Barrel Rotation Speed	Kneading Strength (SME)	Internal Pressure (Outlet Pressure)	Drying Conditions	Retention Time with Dry Basis Moisture Content of ≥ 25 Mass %
		Equipment Type	Ratio of Flight Screw Part	Kneading Part	Water Injection Method	(1) (Inlet Temp.)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (Outlet Temp.)					
							%			°C	°C	°C	°C	°C	°C	°C	°C	°C	rpm
Test Example	61	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	85	325	410	0.3	Dried at normal temperature	0.3
Test Example	62	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	85	325	457	0.3	Dried at normal temperature	1
Test Example	63	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	85	325	625	1.5	Dried at normal temperature	3
Test Example	64	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	85	325	869	5.1	Dried at normal temperature	10
Test Example	65	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	85	325	905	8.5	Dried at normal temperature	15
Comparative Example	1	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Comparative Example	2	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Comparative Example	3	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Comparative Example	4	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	888	7	Dried at normal temperature	1
Comparative Example	5	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Comparative Example	6	N.A. (Commercial Products)																	
Comparative Example	7																		
Comparative Example	8																		
Comparative Example	9	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	40	40	40	40	40	40	40	40	325	1313	10.5	Dried at normal temperature	5
Comparative Example	10	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	80	80	80	80	80	80	80	80	325	1158	6	Dried at normal temperature	1
Comparative Example	11	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	60	80	80	80	80	80	80	80	325	1004	6.3	Dried at normal temperature	2

FIG. 2D

Table 2		Processing Conditions															Post-Treatment		
		Equipment used				Temperature Conditions for Each Barrel Part									Barrel Rotation Speed	Kneading Strength (SME)	Internal Pressure (Outlet Pressure)	Drying Conditions	Retention Time with Dry Basis Moisture Content of ≥ 25 Mass %
		Equipment Type	Ratio of Flight Screw Part	Kneading Part	Water Injection Method	(1) (Inlet Temp.)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (Outlet Temp.)					
							%			°C	°C	°C	°C	°C	°C	°C	°C	°C	rpm
Comparative Example	12	Biaxial Extruder	100	—	All raw material powder and water were mixed as dough and injected at (1)	—	60	80	100	100	100	100	100	80	150	428	6.1	Dried at normal temperature	1
Comparative Example	13	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	60	80	100	100	100	100	100	80	325	927	5.8	Dried at normal temperature	1
Comparative Example	14	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	325	927	6.6	Dried at normal temperature	1
Comparative Example	15	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	85	325	250	0.1	Dried at normal temperature	0.01
Comparative Example	16	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	85	325	355	0.1	Dried at normal temperature	0.1
Referential Example	1	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	90	120	120	120	120	100	80	325	849	6.5	Dried at normal temperature	1
Referential Example	2	Biaxial Extruder	100	—	All raw material powder and water were mixed as dough and injected at (1)	—	90	100	120	120	120	120	95	80	150	270	1.5	Dried at normal temperature	1
Referential Example	3	Biaxial Extruder	80	(4), (6)	Raw material powder was injected at (1), and all water was injected at (3)	—	90	90	120	120	120	120	100	80	325	927	5.8	Dried at normal temperature	1
Referential Example	4	Biaxial Extruder	80	(4), (6)	Raw material powder was injected at (1), and all water was injected at (3)	—	100	100	120	120	120	120	100	80	325	927	5.8	Dried at normal temperature	1
Referential Example	5	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	140	180	180	180	180	130	80	325	965	5.5	Dried at normal temperature	1
Referential Example	6	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	120	180	180	180	180	95	80	325	849	6.5	Dried at normal temperature	1
Referential Example	7	Biaxial Extruder	80	(4), (6)	All raw material powder and water were mixed as dough and injected at (1)	—	90	140	200	200	200	200	100	80	325	849	6.5	Dried at normal temperature	1

FIG. 3A

Table 3		Measurements for Composition											
		Starch	Protein	Insoluble Dietary Fiber	D50 after Amylase/ Protease & Ultrasonic Treatment	Dry Mass Basis Moisture Content	Composition Shape	Image Analysis with 200x Magnification of Frozen Section along Transverse Axis (Composition Heated at 90°C for 6 Min in Water)					
								CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites	
								Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio
		Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	μm	Mass %		%	%	μm^2		μm	
Test Example	1	75.0	8.0	7.5	8	5	Noodles with 1 mm Dia.	23.3%	6.4%	1117.0	0	17	1.8
Test Example	2	75.0	8.0	7.5	33	5	Noodles with 1 mm Dia.	17.8%	4.9%	844.0	0	48	1.8
Test Example	3	75.0	8.0	7.5	20	5	Noodles with 1 mm Dia.	16.7%	4.6%	929.6	0	30	1.7
Test Example	4	55.0	17.0	10.5	56	3	Noodles with 3 mm Dia.	24.6%	11.1%	1937.5	16	67	1.9
Test Example	5	50	30.0	6.5	163	10	Noodles with 1 mm Dia.	33.7%	8.1%	3439.3	0	163	2.3
Test Example	6	20.0	70.0	2.5	115	6	Noodles with 1 mm Dia.	13.9%	4.1%	714.7	0	112	1.9
Test Example	7	15.5	85.0	2.2	35	6	Noodles with 1 mm Dia.	17.7%	5.7%	2220.2	2	30	1.6
Test Example	8	30.0	50.0	7.5	160	6	Noodles with 1 mm Dia.	20.7%	6.5%	1951.3	22	289	2.6
Test Example	9	25.0	60.0	6.0	200	6	Noodles with 1 mm Dia.	14.5%	2.6%	2985.1	25	296	2.2
Test Example	10	50	25.0	5.0	51	10	Noodles with 1 mm Dia.	6.8%	1.5%	718.7	0	53	1.8
Test Example	11	50	18.0	30.5	380	10	Noodles with 1 mm Dia.	5.3%	0.5%	464.3	0	462	5.0
Test Example	12	55	20.0	15.0	168	10	Noodles with 1 mm Dia.	8.6%	2.5%	1468.6	0	205	1.9
Test Example	13	65.0	14.0	10.5	61	5	Noodles with 1 mm Dia.	53.8%	9.1%	2083.3	0	82	1.9
Test Example	14	50	20.0	2.3	156	6	Noodles with 1 mm Dia.	41.1%	14.3%	9783.3	0	228	2.6
Test Example	15	55	22.5	4.0	112	6	Noodles with 1 mm Dia.	27.3%	8.0%	2204.2	0	186	2.3
Test Example	16	70.0	10.0	12.0	130	5	Noodles with 1 mm Dia.	11.5%	3.7%	283.6	0	162	2.2
Test Example	17	55	15.0	9.0	121	6	Noodles with 1 mm Dia.	28.6%	9.9%	2199.5	0	144	2.1
Test Example	18	55	19.5	4.0	110	6	Noodles with 1 mm Dia.	28.6%	13.0%	809.3	0	110	2.0
Test Example	19	50.0	30.0	2.2	350	10	Noodles with 1 mm Dia.	42.5%	7.2%	2793.7	0	485	3.6
Test Example	20	55	25.0	2.3	256	6	Noodles with 1 mm Dia.	26.7%	9.7%	3587.3	0	319	2.5
Test Example	21	80.0	6.0	6.7	264	5	Noodles with 1 mm Dia.	40.6%	8.5%	1095.8	0	319	2.7
Test Example	22	75.0	5.5	14.0	360	5	Noodles with 1 mm Dia.	35.1%	9.4%	1425.7	0	477	3.5

FIG. 3B

Table 3		Measurements for Composition											
		Starch	Protein	Insoluble Dietary Fiber	D50 after Amylase/ Protease & Ultrasonic Treatment	Dry Mass Basis Moisture Content	Composition Shape	Image Analysis with 200x Magnification of Frozen Section along Transverse Axis (Composition Heated at 90°C for 6 Min in Water)					
								CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites	
								Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio
		Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	μm	Mass %		%	%	μm^2		μm	
Test Example	23	80.0	6.8	6.7	4	5	Noodles with 1 mm Dia.	53.4%	13.1%	5474.4	0	10	1.2
Test Example	24	70.0	6.6	18.0	186	5	Noodles with 1 mm Dia.	16.6%	3.4%	385.1	0	486	4.8
Test Example	25	45.0	30.0	2.0	350	10.0	Noodles with 1 mm Dia.	40.8%	17.8%	3069.3	5	418	3.9
Test Example	26	55	21.7	4.0	361	6	Noodles with 1 mm Dia.	41.9%	13.5%	2403.1	0	456	3.8
Test Example	27	55.0	15.0	5.0	420	10.0	Noodles with 1 mm Dia.	23.7%	5.2%	3275.2	5	479	4.5
Test Example	28	80.0	6.6	2.0	13	5	Noodles with 1 mm Dia.	3.8%	1.8%	154.1	0	19	1.7
Test Example	29	70.0	9.4	2.6	10	5	Noodles with 1 mm Dia.	6.3%	2.0%	161.6	0	17	1.6
Test Example	30	42.0	26.8	3.6	368	5	Noodles with 1 mm Dia.	10.3%	2.6%	775.8	5	504	3.8
Test Example	31	22.6	44.6	19.6	360	8	Noodles with 1 mm Dia.	6.5%	2.2%	808.6	10	488	4.0
Test Example	32	55.0	17.0	25.0	94	5	Noodles with 2 mm Dia.	7.2%	1.6%	775.5	0	167	2.1
Test Example	33	39.9	25.1	14.0	80	5	Noodles with 1 mm Dia.	24.0%	7.1%	1292.4	0	148	2.2
Test Example	34	55.0	21.7	16.2	69	5	Noodles with 1 mm Dia.	16.4%	4.5%	624.4	0	124	2.1
Test Example	35	59.3	17.1	4.5	86	9.7	Noodles with 1 mm Dia.	24.1%	9.1%	796.7	0	188	2.2
Test Example	36	50.2	17.7	7.5	19	5	Noodles with 1 mm Dia.	6.7%	2.3%	953.2	0	21	1.7
Test Example	37	50.0	19.6	8.0	16	8	Noodles with 1 mm Dia.	12.5%	2.6%	1526.7	0	23	1.6
Test Example	38	50.0	19.6	8.0	65	8	Noodles with 1 mm Dia.	10.5%	1.8%	1385.8	0	67	1.8
Test Example	39	50.2	17.7	7.5	68	50	Noodles with 1 mm Dia.	13.2%	2.4%	1846.4	0	124	2.2
Test Example	40	50.2	17.7	7.5	49	5	Plates in 1mm x 10mm	11.8%	2.1%	1744.6	21	80	1.9
Test Example	41	55.0	17.0	25.0	10	5	Noodles with 2 mm Dia.	10.0%	2.5%	632.6	0	13	1.6
Test Example	42	55.0	17.0	25.0	69	5	Noodles with 2 mm Dia.	6.8%	1.7%	1184.6	0	105	2.0
Test Example	43	55.0	17.0	25.0	78	5	Noodles with 2 mm Dia.	8.5%	2.6%	797.9	0	116	2.1
Test Example	44	55.0	17.0	25.0	69	5	Noodles with 2 mm Dia.	9.6%	3.0%	576.2	0	110	2.2

FIG. 3C

Table 3		Measurements for Composition											
		Starch	Protein	Insoluble Dietary Fiber	D50 after Amylase/ Protease & Ultrasonic Treatment	Dry Mass Basis Moisture Content	Composition Shape	Image Analysis with 200x Magnification of Frozen Section along Transverse Axis (Composition Heated at 90°C for 6 Min in Water)					
								CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites	
								Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio
		Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	μm	Mass %		%	%	μm^2		μm	
Test Example	45	50.2	17.7	7.5	21	5	Noodles with 1 mm Dia.	11.2%	4.0%	757.1	23	29	1.7
Test Example	46	50.2	17.7	7.5	13	5	Noodles with 1 mm Dia.	10.1%	1.7%	876.7	0	10	1.5
Test Example	47	50.2	23.4	7.5	32	5	Noodles with 1 mm Dia.	12.6%	3.4%	964.0	0	40	1.9
Test Example	48	50.2	17.7	15.5	162	5	Noodles with 1 mm Dia.	10.7%	2.1%	935.2	0	257	3.0
Test Example	49	50.2	17.7	7.5	9	5	Noodles with 20 mm Dia.	7.7%	2.1%	704.9	21	8	1.4
Test Example	50	50.2	17.7	7.5	30	5	Noodles with 1 mm Dia.	12.1%	2.1%	1275.0	0	29	1.7
Test Example	51	50.2	17.7	7.5	12	5	Noodles with 1 mm Dia.	14.1%	1.9%	2475.4	0	40	1.8
Test Example	52	50.2	17.7	7.5	48	5	Noodles with 1 mm Dia.	15.3%	3.4%	941.7	0	67	1.9
Test Example	53	50.2	17.7	7.5	149	5	Noodles with 1 mm Dia.	11.2%	2.7%	776.9	0	481	3.6
Test Example	54	50.2	17.7	25.0	23	5	Noodles with 1 mm Dia.	12.7%	3.2%	940.9	23	82	2.2
Test Example	55	50.2	21.0	25.0	32	5	Noodles with 1 mm Dia.	13.3%	3.0%	971.0	0	49	2.1
Test Example	56	50.2	17.7	7.5	20	5	Noodles with 1 mm Dia.	7.5%	0.8%	1792.8	0	29	1.9
Test Example	57	50.2	17.7	7.5	16	5	Noodles with 1 mm Dia.	16.0%	5.4%	862.1	0	48	2.0
Test Example	58	50.2	17.7	7.5	23	5	Noodles with 1 mm Dia.	5.9%	1.7%	1337.9	0	67	2.2
Test Example	59	50.2	17.7	7.5	21	5	Noodles with 1 mm Dia.	7.7%	2.8%	1105.7	0	67	1.9
Test Example	60	50.2	17.7	7.5	19	5	Noodles with 1 mm Dia.	7.9%	1.7%	1211.1	0	15	1.5
Test Example	61	50.2	17.7	7.5	15	5	Noodles with 20 mm Dia.	3.8%	1.0%	161.0	31	28	2.2
Test Example	62	50.2	17.7	7.5	9	5	Noodles with 20 mm Dia.	5.6%	1.5%	356.2	0	26	1.8
Test Example	63	50.2	17.7	7.5	9	5	Noodles with 20 mm Dia.	8.9%	3.5%	1058.5	0	16	1.5
Test Example	64	50.2	17.7	7.5	8	5	Noodles with 20 mm Dia.	17.7%	5.9%	2671.4	0	15	1.5
Test Example	65	50.2	17.7	7.5	8	5	Noodles with 20 mm Dia.	25.6%	10.6%	3515.5	0	13	1.4

Table 3		Measurements for Composition											
		Starch	Protein	Insoluble Dietary Fiber	D50 after Amylase/ Protease & Ultrasonic Treatment	Dry Mass Basis Moisture Content	Composition Shape	Image Analysis with 200x Magnification of Frozen Section along Transverse Axis (Composition Heated at 90°C for 6 Min in Water)					
								CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites	
								Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio
		Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	Mass % (Dry Mass Basis)	μm	Mass %		%	%	μm^2		μm	
Comparative Example	1	90.0	0.0	2.0	15	6	Noodles with 1 mm Dia.	6.3%	0.2%	512.0	0	19	1.6
Comparative Example	2	80	5.0	6.5	53	10	Noodles with 1 mm Dia.	14.0%	0.2%	419.9	0	67	1.8
Comparative Example	3	13.0	75.0	5.0	32	6	Noodles with 1 mm Dia.	39.3%	0.1%	2350.0	3	48	1.8
Comparative Example	4	66.5	33.0	5.5	13	15	Noodles with 1 mm Dia.	1.1%	0.6%	286.3	0	21	1.9
Comparative Example	5	55	24.9	4.0	5	6	Noodles with 1 mm Dia.	1.4%	0.5%	145.9	0	6	1.3
Comparative Example	6	64.1	11.6	1.2	860	5	Noodles with 1 mm Dia.	1.8%	0.1%	468.0	0	1079	9.0
Comparative Example	7	80.4	0.2	4.1	554	6	Noodles with 1 mm Dia.	0.4%	0.0%	285.8	0	804	6.2
Comparative Example	8	62.7	8.5	1.8	650	13	Noodles with 5 mm Dia.	5.3%	0.0%	760.0	0	990	6.8
Comparative Example	9	50.2	17.7	7.5	52	5	Noodles with 1 mm Dia.	2.2%	0.1%	712.1	0	72	2.2
Comparative Example	10	50.2	23.4	7.5	32	5	Noodles with 1 mm Dia.	1.8%	0.3%	711.6	0	53	2
Comparative Example	11	50.2	17.7	14.0	236	5	Noodles with 1 mm Dia.	5.8%	0.3%	1552.0	0	359	3.8
Comparative Example	12	50.2	17.7	7.5	11	5	Noodles with 1 mm Dia.	1.2%	0.1%	501.6	34	13	1.7
Comparative Example	13	50.2	17.7	7.5	23	5	Noodles with 1 mm Dia.	0.9%	0.0%	689.8	0	29	1.8
Comparative Example	14	50.2	17.7	7.5	751	5	Noodles with 1 mm Dia.	0.2%	0.0%	48545.5	0	695	5.5
Comparative Example	15	50.2	17.7	7.5	25	5	Noodles with 20 mm Dia.	0.1%	0.1%	31.5	125	32	3.3
Comparative Example	16	50.2	17.7	7.5	19	5	Noodles with 20 mm Dia.	0.2%	0.1%	38.6	101	30	3.1

FIG. 4A

Table 4		Measurements for Composition						Sensory Evaluation				
		Image Analysis with 200x Magnification of Frozen Section along Longitudinal Axis (Composition Heated at 90°C for 6 Min in Water)						Elasticity	Texture that Passes Smoothly through the Teeth when Chewed	Ease of Biting Through	Overall Evaluation	Comments
		CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites						
		Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio					
Test Example	1	19.2%	5.4%	1160.7	0	15	1.6	5	4	4	5	
Test Example	2	14.7%	3.9%	922.8	0	41	1.6	5	4	4	5	
Test Example	3	23.0%	7.6%	820.6	0	44	2.5	4	4	4	4	
Test Example	4	24.2%	9.7%	1287.3	10	39	1.1	5	5	4	5	
Test Example	5	31.3%	6.0%	2699.8	0	95	1.3	5	5	5	5	
Test Example	6	15.4%	3.2%	839.0	0	103	1.7	4	5	5	4	
Test Example	7	13.0%	1.9%	1157.5	1	5	1.3	4	4	4	4	
Test Example	8	18.6%	3.1%	8474.8	25	598	5.4	5	5	4	5	
Test Example	9	21.0%	2.6%	2076.2	23	206	1.5	5	5	4	5	
Test Example	10	11.2%	1.2%	710.0	0	42	1.9	5	5	4	5	
Test Example	11	3.6%	0.5%	739.3	0	736	8.0	5	4	4	4	
Test Example	12	9.0%	1.8%	1101.6	0	111	2.0	5	5	4	5	
Test Example	13	34.3%	9.2%	912.5	0	36	1.8	5	5	5	5	
Test Example	14	25.3%	2.4%	2232.7	0	9	1.5	4	5	5	4	
Test Example	15	22.3%	3.8%	2038.1	0	82	2.1	5	5	5	5	
Test Example	16	10.3%	3.5%	331.5	0	179	2.4	5	5	5	4	
Test Example	17	28.0%	5.1%	2702.7	0	91	2.3	5	5	5	5	

FIG. 4B

Table 4		Measurements for Composition						Sensory Evaluation				
		Image Analysis with 200x Magnification of Frozen Section along Longitudinal Axis (Composition Heated at 90°C for 6 Min in Water)						Elasticity	Texture that Passes Smoothly through the Teeth when Chewed	Ease of Biting Through	Overall Evaluation	Comments
		CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites						
		Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio					
		%	%			μm^2						
Test Example	18	24.4%	8.6%	921.9	0	83	2.1	5	5	5	5	
Test Example	19	34.0%	8.4%	2289.5	0	463	3.4	4	5	4	4	
Test Example	20	24.6%	6.7%	2775.3	0	171	2.2	4	5	4	4	
Test Example	21	47.6%	10.0%	1187.8	0	407	3.4	4	4	4	4	
Test Example	22	37.5%	6.5%	1182.4	0	273	2.0	4	4	4	4	
Test Example	23	39.0%	7.8%	1773.4	0	3	1.4	4	4	4	4	
Test Example	24	16.9%	3.0%	585.0	0	652	4.4	4	4	4	4	
Test Example	25	40.8%	17.8%	3069.3	5	418	3.9	4	5	4	4	
Test Example	26	45.5%	14.7%	3229.4	0	667	5.6	4	5	4	4	
Test Example	27	23.7%	5.2%	3275.2	3	479	4.5	4	5	4	4	
Test Example	28	5.1%	1.6%	184.2	0	20	1.8	4	4	4	4	
Test Example	29	5.4%	1.7%	168.1	0	15	1.8	4	5	4	4	
Test Example	30	11.0%	2.1%	825.6	8	433	3.3	4	5	5	5	
Test Example	31	9.5%	1.6%	673.9	6	296	2.4	4	5	5	5	
Test Example	32	7.8%	1.6%	801.6	0	173	2.2	5	5	5	5	Good taste, with no bitterness in the broth
Test Example	33	27.8%	7.7%	1400.8	0	174	2.6	5	5	5	5	
Test Example	34	12.4%	3.9%	958.9	0	164	2.8	5	5	5	5	

FIG. 4C

Table 4		Measurements for Composition						Sensory Evaluation				
		Image Analysis with 200x Magnification of Frozen Section along Longitudinal Axis (Composition Heated at 90°C for 6 Min in Water)						Elasticity	Texture that Passes Smoothly through the Teeth when Chewed	Ease of Biting Through	Overall Evaluation	Comments
		CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites						
		Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio					
Test Example	35	24.1%	9.1%	796.7	0	188	2.2	4	5	4	4	
Test Example	36	8.3%	2.3%	916.7	0	20	1.6	4	4	4	4	
Test Example	37	23.2%	7.4%	853.3	0	36	2.5	5	5	5	5	
Test Example	38	15.0%	3.0%	1632.4	0	131	3.5	5	5	5	5	
Test Example	39	14.2%	2.2%	1256.8	0	77	1.9	5	5	5	5	
Test Example	40	15.3%	3.1%	1360.3	23	92	2.2	5	5	5	5	
Test Example	41	6.8%	1.8%	582.0	0	9	1.6	5	5	5	5	
Test Example	42	9.6%	3.0%	840.9	0	131	2.5	5	5	5	5	Good taste, with no bitterness in the broth
Test Example	43	11.8%	3.5%	802.0	0	157	2.8	5	5	5	5	
Test Example	44	12.2%	3.2%	638.3	0	130	2.6	5	5	5	5	Good taste, with no bitterness in the broth
Test Example	45	15.4%	4.7%	712.1	22	31	1.9	4	4	4	4	
Test Example	46	7.7%	2.2%	971.7	0	14	2.2	5	5	5	5	
Test Example	47	18.3%	5.6%	863.8	0	59	2.8	5	5	5	5	Good taste, with no bitterness in the broth
Test Example	48	9.5%	2.4%	938.9	0	294	3.4	5	5	5	5	
Test Example	49	9.2%	1.4%	963.8	21	7	1.3	5	5	4	5	
Test Example	50	18.1%	3.0%	1759.1	0	56	3.4	5	5	5	5	
Test Example	51	9.7%	1.4%	1131.5	0	13	1.3	4	5	4	4	

FIG. 4D

Table 4		Measurements for Composition						Sensory Evaluation				
		Image Analysis with 200x Magnification of Frozen Section along Longitudinal Axis (Composition Heated at 90°C for 6 Min in Water)						Elasticity	Texture that Passes Smoothly through the Teeth when Chewed	Ease of Biting Through	Overall Evaluation	Comments
		CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites						
		Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio					
Test Example	52	15.4%	4.1%	854.2	0	73	2.1	5	5	5	5	
Test Example	53	18.4%	5.9%	933.0	0	1261	9.4	5	5	5	5	
Test Example	54	14.0%	4.1%	864.4	24	96	2.6	5	5	5	5	
Test Example	55	12.4%	3.1%	887.8	0	47	2.0	5	5	5	5	Good taste, with little bitterness in the broth
Test Example	56	11.6%	1.7%	1190.6	0	40	2.7	5	5	5	5	
Test Example	57	12.2%	3.3%	1309.6	0	44	1.9	5	5	5	5	
Test Example	58	4.8%	1.1%	1287.8	0	41	2.0	5	4	4	5	
Test Example	59	7.2%	0.8%	1043.0	0	18	1.5	5	4	4	5	
Test Example	60	11.4%	2.3%	1399.7	0	24	2.3	5	5	4	5	
Test Example	61	3.4%	1.1%	161.0	33	15	2.9	4	3	3	3	
Test Example	62	6.9%	1.2%	329.2	10	9	1.9	4	4	4	4	
Test Example	63	9.6%	2.9%	1548.3	0	6	1.3	5	5	5	5	
Test Example	64	19.9%	6.9%	2514.8	0	6	1.3	5	5	5	5	
Test Example	65	29.5%	11.4%	3415.2	0	3	1.2	5	5	5	5	
Comparative Example	1	15.7%	0.8%	841.0	0	125	10.5	5	1	1	1	
Comparative Example	2	10.0%	0.5%	402.9	0	160	4.3	5	2	1	2	
Comparative Example	3	14.5%	0.6%	1227.9	5	149	5.6	2	4	4	3	

FIG. 4E

Table 4		Measurements for Composition						Sensory Evaluation				
		Image Analysis with 200x Magnification of Frozen Section along Longitudinal Axis (Composition Heated at 90°C for 6 Min in Water)						Elasticity	Texture that Passes Smoothly through the Teeth when Chewed	Ease of Biting Through	Overall Evaluation	Comments
		CBB-Stained Sites with Degrees of Roundness of ≥ 0.3 and Areas of $\geq 200\mu\text{m}^2$		90th Percentile Score of Areas of Stained Sites	Number of Stained Sites with Largest Diameters of $\geq 200\mu\text{m}$	CFW-Stained Sites						
		Number of Specific Stained Sites/ Number of All Stained Sites	Total Area of Specific Stained Sites /Total Viewing Area			Average Largest Diameter	Average Aspect Ratio					
Comparative Example	4	1.5%	0.4%	265.4	0	13	1.2	5	1	2	3	
Comparative Example	5	1.1%	0.4%	134.7	0	4	1.0	5	2	2	2	
Comparative Example	6	1.8%	0.1%	468.0	0	1079	9.0	2	4	5	4	
Comparative Example	7	0.2%	0.0%	223.2	0	628	4.8	5	1	1	1	
Comparative Example	8	2.1%	0.0%	156.5	0	204	1.4	3	1	3	1	
Comparative Example	9	2.9%	0.0%	463.3	0	47	1.4	1	1	4	1	
Comparative Example	10	2.4%	0.2%	821.6	0	41	1.5	2	2	3	2	Unsuitable for eating, with bitterness in the broth
Comparative Example	11	5.3%	0.2%	462.3	0	71	0.8	2	3	3	2	
Comparative Example	12	1.4%	0.1%	805.2	36	21	2.7	3	2	3	2	
Comparative Example	13	2.1%	0.1%	730.5	0	30	1.9	3	2	4	3	
Comparative Example	14	0.200%	0.100%	244049.6	0	994	7.9	1	1	1	1	Pulsating and unstable during extrusion, difficult to manufacture. Non-uniform composition surface.
Comparative Example	15	0.1%	0.1%	31.22	115	33	4.9	1	1	1	1	
Comparative Example	16	0.2%	0.1%	36.5	95	23	3.9	2	1	1	1	

Table 5		Observation of 6% Suspension of Crushed Composition at 200x magnification	Sensory Evaluation	Absorbance Difference Iodine Staining (500nm, 20°C, 3min, filtered with 0.20µm)		Sensory Evaluation	Analysis of 1% Glucoamylase Reaction Solution (10 mass% Sample, 20°C, 2H Treatment)		Sensory Evaluation
		Number of Starch Grain Structures in the View	Rough Texture	Non-crushed Composition	Crushed Composition	Stickiness of Composition Surface	Glucose Content in Reaction Solution with Composition	Ratio of Glucose Content (Reaction with Non-crushed Composition / Reaction with Crushed Composition)	Surface Smoothness
							Mass %	%	
Test Example	30	0	5	0.11	0.16	5	2.15	41.0	4
Test Example	31	0	5	0.12	0.19	5	2.35	45.0	3
Test Example	41	0	5	0.56	0.88	4	0.91	45.0	4
Test Example	42	0	5	0.10	0.16	5	0.56	30.0	5
Test Example	43	0	5	0.09	0.31	5			
Test Example	44	0	5	0.07	0.15	5	0.45	24.0	5
Test Example	47	0	5	0.23	0.27	5	1.19	45.0	5
Test Example	49	0	5	0.12	0.23	5			
Test Example	50	0	5	0.32	1.12	4			
Test Example	51	0	4	0.41	1.27	3			
Test Example	52	0	5	0.09	0.34	5			
Test Example	53	0	5	0.19	0.45	5			
Test Example	54	0	4	0.14	0.45	5			
Test Example	55	0	5	0.11	0.30	5	0.59	30.0	5
Test Example	56	0	5	0.36	0.22	4	1.59	47.8	4
Test Example	57	0	5	0.13	0.16	5	0.30	20.0	5
Test Example	58	0	5	0.18	0.24	5			
Test Example	59	0	5	0.21	0.25	5			
Test Example	60	0	5	0.18	0.19	5			

Table 5		Observation of 6% Suspension of Crushed Composition at 200x magnification	Sensory Evaluation	Absorbance Difference Iodine Staining (500nm, 20°C, 3min, filtered with 0.20µm)		Sensory Evaluation	Analysis of 1% Glucoamylase Reaction Solution (10 mass% Sample, 20°C, 2H Treatment)		Sensory Evaluation
		Number of Starch Grain Structures in the View	Rough Texture	Non-crushed Composition	Crushed Composition	Stickiness of Composition Surface	Glucose Content in Reaction Solution with Composition	Ratio of Glucose Content (Reaction with Non-crushed Composition / Reaction with Crushed Composition)	Surface Smoothness
							Mass %	%	
Test Example	61	0	5	0.69	0.98	3	2.25	49.0	3
Test Example	62	0	5	0.38	0.51	4	1.01	45.0	4
Test Example	63	0	5	0.09	0.13	5	0.81	32.0	5
Test Example	64	0	5	0.06	0.09	5	0.35	25.0	5
Test Example	65	0	5	0.05	0.08	5	0.19	20.0	5
Comparative Example	9	>1000	1	0.56	1.50	3			
Comparative Example	10	>1000	1	0.15	-0.03	5	2.50	60.0	1
Comparative Example	11	>1000	1	0.14	0.01	5			
Comparative Example	12	470	3	0.45	0.89	4			
Comparative Example	13	105	3	0.20	0.55	5	1.09	55.0	3
Comparative Example	14	0							
Comparative Example	15	450	2	1.68	1.98	1	2.90	56.0	1
Comparative Example	16	325	2	1.36	1.69	1	2.50	52.0	1
Referential Example	1	0	5	0.54	1.40	2			
Referential Example	2	352	2	0.71	1.3	2	0.49	60.0	3
Referential Example	3	0	4	0.76	1.87	2			
Referential Example	4	0	4	0.87	1.89	1			
Referential Example	5	0	4	0.79	1.23	2			
Referential Example	6	0	4	0.74	1.34	2			
Referential Example	7	0	4	0.91	1.50	1			

FIG. 6A

Table 6		Image Analysis with 200x magnification of Frozen Section (Dried Composition)								Sensory Evaluation	Soluble Amino Acids					
		Frozen Section along Transverse Axis					Frozen Section along Longitudinal Axis			Fragrance after Storage (15min)	Soluble GABA (Composition)	Soluble GABA (Composition)/ All Soluble Amino Acids (Composition)	Soluble GABA (Composition)/ Soluble GABA (Raw Material before Processing)	Soluble LEU (Composition)	Soluble LEU (Composition)/ All Soluble Amino Acids (Composition)	Soluble LEU (Composition)/ Soluble GABA (Raw Material before Processing)
		Average Thickness of Smooth Tissue Part	Presence of CBB -Stained Sites in Smooth Tissue Part	Smooth Tissue Part/ Composition Perimeter	Average Crystallinity		Average Thickness of Smooth Tissue Part	Presence of CBB -Stained Sites in Smooth Tissue Part	Smooth Tissue Part/ Composition Perimeter							
		μm		%	Comparison of Crystallinity	Crystallinity Ratio (Non-smooth Tissue Part /Smooth Tissue Part)	μm		%							
Test Example	30	25	CBB-Stained Sites Observed in Smooth Tissue Part	90	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	1.5	29	CBB-Stained Sites Observed in Smooth Tissue Part	50	4	—	—	—	—	—	—
Test Example	31	19	CBB-Stained Sites Observed in Smooth Tissue Part	80	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	1.1	19	CBB-Stained Sites Observed in Smooth Tissue Part	50	3	—	—	—	—	—	—
Test Example	42	87	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	15.2	85	CBB-Stained Sites Observed in Smooth Tissue Part	50	5	1.1	0.4	4	1.0	0.3	12
Test Example	44	80	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	1.3	79	CBB-Stained Sites Observed in Smooth Tissue Part	50	5	2.4	0.4	8	5.5	0.8	34
Test Example	47	66	CBB-Stained Sites Observed in Smooth Tissue Part	90	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	Peak Found in Non-smooth Tissue Part, No Peak Found in Smooth Tissue Part	62	CBB-Stained Sites Observed in Smooth Tissue Part	40	4	2.7	0.4	17	5.2	0.8	36
Test Example	55	79	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	4.2	73	CBB-Stained Sites Observed in Smooth Tissue Part	50	5	10.4	1.0	7	8.0	0.7	24
Test Example	57	121	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	2	121	CBB-Stained Sites Observed in Smooth Tissue Part	50	5	—	—	—	—	—	—
Test Example	61	19	CBB-Stained Sites Observed in Smooth Tissue Part	80	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	1.1	15	CBB-Stained Sites Observed in Smooth Tissue Part	50	3	—	—	—	—	—	—
Test Example	62	32	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	2.0	35	CBB-Stained Sites Observed in Smooth Tissue Part	50	4	—	—	—	—	—	—

FIG. 6B

Table 6		Image Analysis with 200x magnification of Frozen Section (Dried Composition)								Sensory Evaluation	Soluble Amino Acids					
		Frozen Section along Transverse Axis					Frozen Section along Longitudinal Axis			Fragrance after Storage (15min)	Soluble GABA (Composition)	Soluble GABA (Composition)/ All Soluble Amino Acids (Composition)	Soluble GABA (Composition)/ Soluble GABA (Raw Material before Processing)	Soluble LEU (Composition)	Soluble LEU (Composition)/ All Soluble Amino Acids (Composition)	Soluble LEU (Composition)/ Soluble GABA (Raw Material before Processing)
		Average Thickness of Smooth Tissue Part	Presence of CBB-Stained Sites in Smooth Tissue Part	Smooth Tissue Part/ Composition Perimeter	Average Crystallinity		Average Thickness of Smooth Tissue Part	Presence of CBB-Stained Sites in Smooth Tissue Part	Smooth Tissue Part/ Composition Perimeter							
		μm		%	Comparison of Crystallinity	Crystallinity Ratio (Non-smooth Tissue Part /Smooth Tissue Part)	μm		%							
Test Example	63	85	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	15.2	112	CBB-Stained Sites Observed in Smooth Tissue Part	50	5	—	—	—	—	—	—
Test Example	64	125	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	1.3	135	CBB-Stained Sites Observed in Smooth Tissue Part	50	5	—	—	—	—	—	—
Test Example	65	165	CBB-Stained Sites Observed in Smooth Tissue Part	100	Smooth Tissue Part < Non-smooth Tissue Part (Center of Composition)	1.3	165	CBB-Stained Sites Observed in Smooth Tissue Part	50	5	—	—	—	—	—	—
Comparative Example	10	None	—	0	—	—	None	—	0	1	28.8	4.2	60	11.8	1.7	65
Comparative Example	13	20	CBB-Stained Sites Observed in Smooth Tissue Part	50	Smooth Tissue Part = Non-smooth Tissue Part (Center of Composition)	N.A. (Crystallinity in Smooth Tissue Part = 0)	24	CBB-Stained Sites Observed in Smooth Tissue Part	20	3	—	—	—	—	—	—
Comparative Example	15	None	—	0	—	—	None	—	0	1	—	—	—	—	—	—
Comparative Example	16	None	—	0	—	—	None	—	0	1	—	—	—	—	—	—
Referential Example	2	None	—	0	—	—	None	—	0	1	—	—	—	—	—	—

FIG. 7

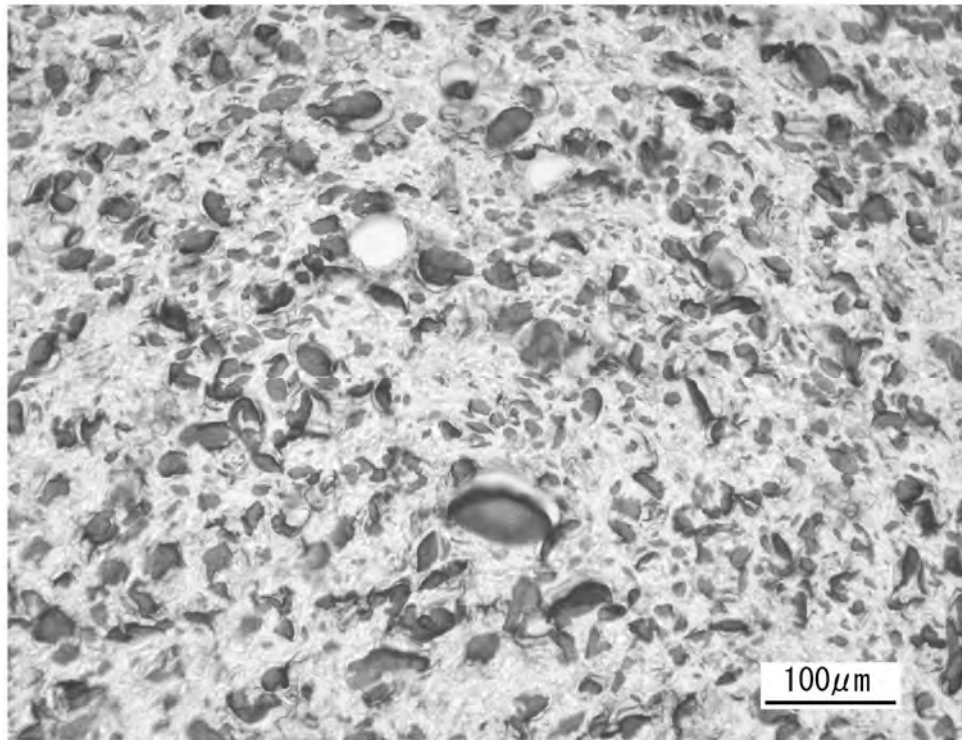


FIG. 8

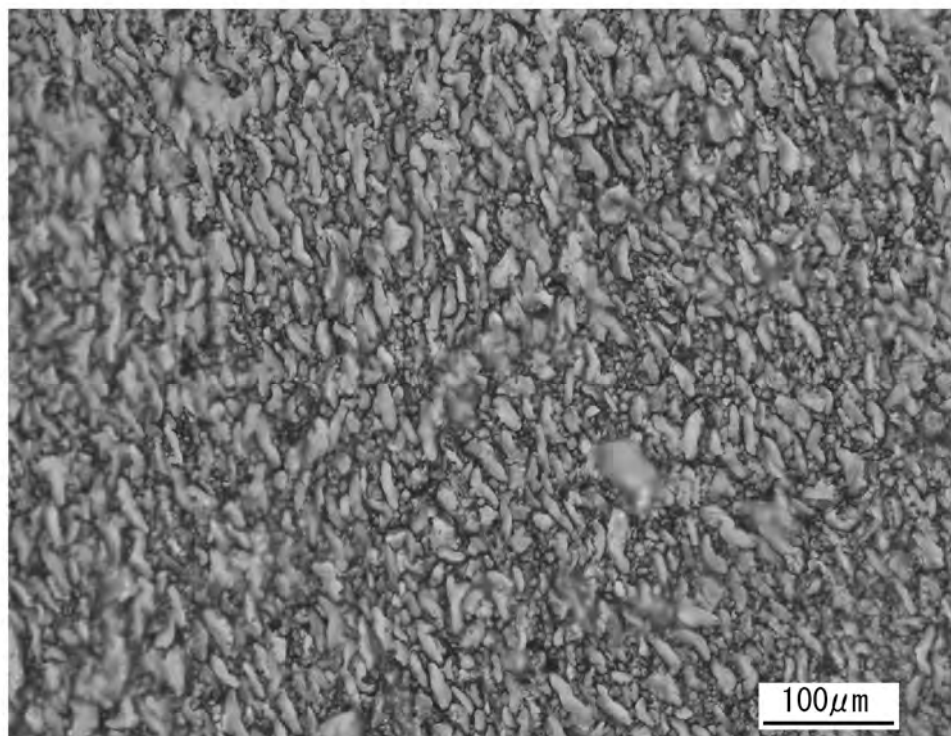
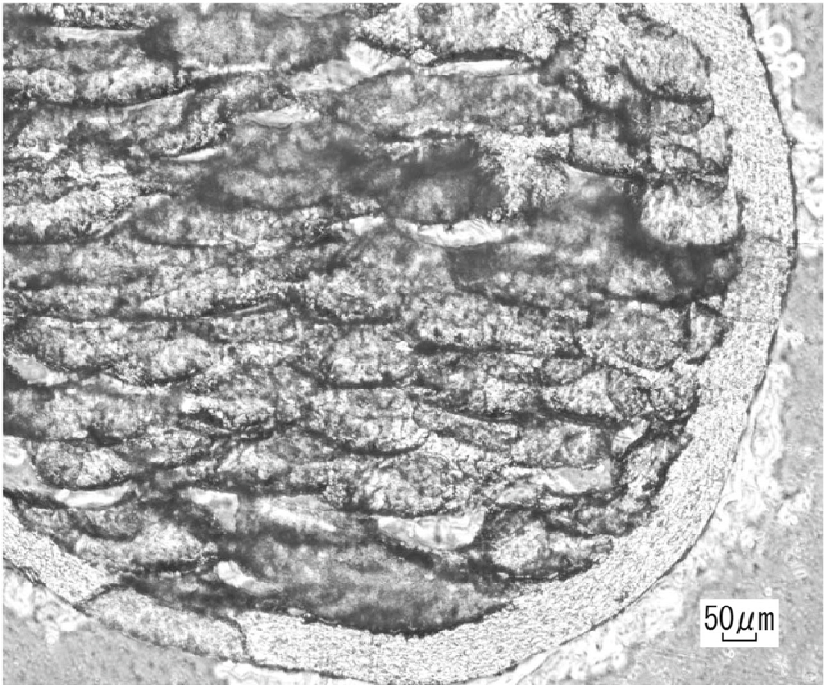


FIG. 9

A



B

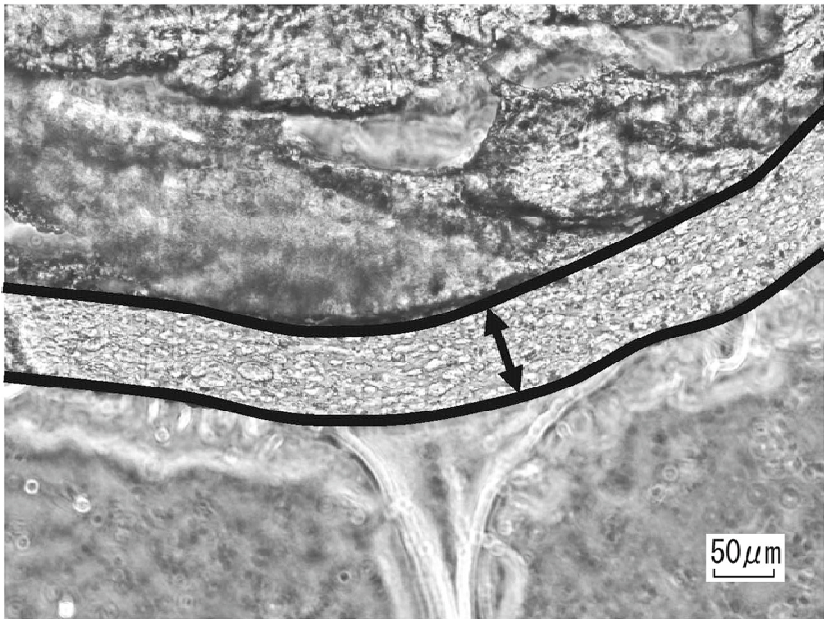


FIG. 10

