

Table S1 The chemical composition of D70, D90, WPC, and SMP.

Sample		Source	Manufacturers	Protein (%)	Lactose (%)	Fat (%)	Moisture (%)	Ash (%)
D70	1	Ireland	Dairygold Food Ingredients Co., Ltd	13.69	81.75	1.18	0.99	2.17
	2	Finland	Valio Co., Ltd	13.00	81.90	0.90	1.40	2.80
	3	Germany	Alpavit Co., Ltd	12.50	83.20	0.70	1.10	2.60
	4	France	Euroserum Co., Ltd	12.60	82.10	0.90	1.80	2.70
	5	France	Lactalis Co., Ltd.	12.66	82.20	1.20	1.60	2.50
D90	1	France	Lactalis Co., Ltd.	13.59	79.00	1.20	0.85	0.54
	2	Germany	Alpavit Co., Ltd.	12.80	84.47	0.84	1.37	0.70
	3	Finland	Valio Co., Ltd.	12.90	84.10	0.90	1.20	0.70
	4	Netherlands	Frieslandcampina Co., Ltd.	13.50	83.00	0.30	2.10	0.80
	5	Germany	Hochwald Foods Whey Ingredients Co., Ltd	12.87	80.00	0.60	1.19	0.84
WPC	1	Germany	LIMEI Co., Ltd.	80.80	6.80	4.50	4.30	3.60
	2	America	Hilmar Ingredients Co., Ltd.	78.51	7.02	4.53	4.31	4.93
	3	Germany	Sachsenmilch Co., Ltd.	77.68	7.05	4.68	4.43	3.92
	4	Germany	Wheyco Co., Ltd.	77.77	7.09	5.67	4.81	4.66
	5	Germany	Hochwald Foods Whey Ingredients Co., Ltd.	76.40	6.90	6.60	4.60	2.50
SMP	1	Australia	Union Dairy Co., Ltd.	34.70	53.46	0.80	4.17	6.87
	2	Germany	Molkerei Ammerland Co., Ltd.	32.90	55.40	0.54	2.71	7.96
	3	Finland	Valio Co., Ltd.	38.00	50.00	0.54	3.80	7.79
	4	Ireland	Kerry Co., Ltd.	34.97	54.20	0.70	3.20	7.60
	5	Ireland	Dairygold Food Ingredients Co., Ltd.	35.00	53.80	0.90	3.20	7.10

Table S2. Foaming and physicochemical properties of D70, D90, WPC, and SMP.

	D70	D90	WPC	SMP
Foaming capacity (%)	80.3 \pm 9.7 ^{ab}	78.8 \pm 8.6 ^{ab}	74.1 \pm 9.7 ^b	90.7 \pm 9.7 ^a
Foam stability (%)	37.5 \pm 18.7 ^b	31.6 \pm 13.0 ^{bc}	16.5 \pm 4.3 ^c	58.2 \pm 5.5 ^a
Particle size (nm)	261.4 \pm 33.9 ^{ab}	227.7 \pm 23.5 ^b	280.5 \pm 47.9 ^a	223.6 \pm 15.5 ^b
Zeta potential (mV)	-22.3 \pm 1.9 ^b	-25.3 \pm 4.2 ^b	-23.7 \pm 4.0 ^b	-17.6 \pm 0.9 ^a
Turbidity	0.30 \pm 0.09 ^b	0.20 \pm 0.01 ^b	0.27 \pm 0.09 ^b	0.73 \pm 0.13 ^a
Solubility (%)	93.7 \pm 3.8 ^a	88.5 \pm 6.9 ^a	86.4 \pm 6.6 ^a	65.5 \pm 6.1 ^b
Surface hydrophobicity	5014.6 \pm 556.6 ^a	4667.6 \pm 702.7 ^a	3138.4 \pm 186.4 ^b	2999.5 \pm 245.6 ^b
Free sulfhydryl content (μ mol/g)	15.9 \pm 3.2 ^a	13.4 \pm 3.8 ^a	13.6 \pm 4.0 ^a	5.1 \pm 0.5 ^b
α -helix (%)	15.9 \pm 0.6 ^{ab}	16.2 \pm 0.8 ^b	15.6 \pm 1.6 ^a	14.9 \pm 0.4 ^c
β -sheet (%)	28.2 \pm 0.6 ^b	27.9 \pm 0.8 ^b	29.2 \pm 1.4 ^a	25.6 \pm 0.6 ^c
β -turn (%)	23.5 \pm 0.4 ^b	23.6 \pm 0.3 ^b	22.9 \pm 0.4 ^c	24.9 \pm 0.2 ^a
Random coil (%)	32.3 \pm 0.4 ^b	32.3 \pm 0.3 ^b	32.3 \pm 0.1 ^b	36.4 \pm 0.3 ^a

Different letters (a-c) indicate significant differences at $p < 0.05$.