

Supporting Information

Batch Size: 351 gallons (Standard Mix)

Batch Size: 104 gallons (HFP)

Density: 1.114 kg/L (S)

Density: 1.126 kg/L (HFP)

Table S1. Ingredients breakdown for the standard mix.

Ingredient (Standard)	BF%	MSNF%	Gallons	Pounds	Kg	kg/kg
Water			135	1,124.55	510.01	0.344
Cream	30.33	6.3	153	1,286.73	583.69	0.394
Nonfat Dry Milk		95		278	126.1	0.085
Dry Sucrose				553.35	251.01	0.170
Stabilizer (Crest 26-2229)				12.69	5.76	0.004
Vanilla					0.17%	0.0017

Table S2. Ingredients breakdown for the standard mix.

Ingredient (HFP)	BF%	MSNF%	Gallons	Pounds	Kg	Kg/kg of Ice cream
Skim Milk		31.74	42.569	366.092	166.021	0.375
Cream	30.97	22.782	43.218	364.223	165.237	0.373
Skim Powder		44.37		46.218	20.968	0.047
Sugar				94	42.638	0.096
Soluble Corn Fiber				65.8	29.854	0.067
Stabilizer (Crest 26-2229)				3.666	1.663	0.004
Vanilla					0.17%	0.0017

Fig S1. Overall environmental impact of Standard and HFP ice cream production

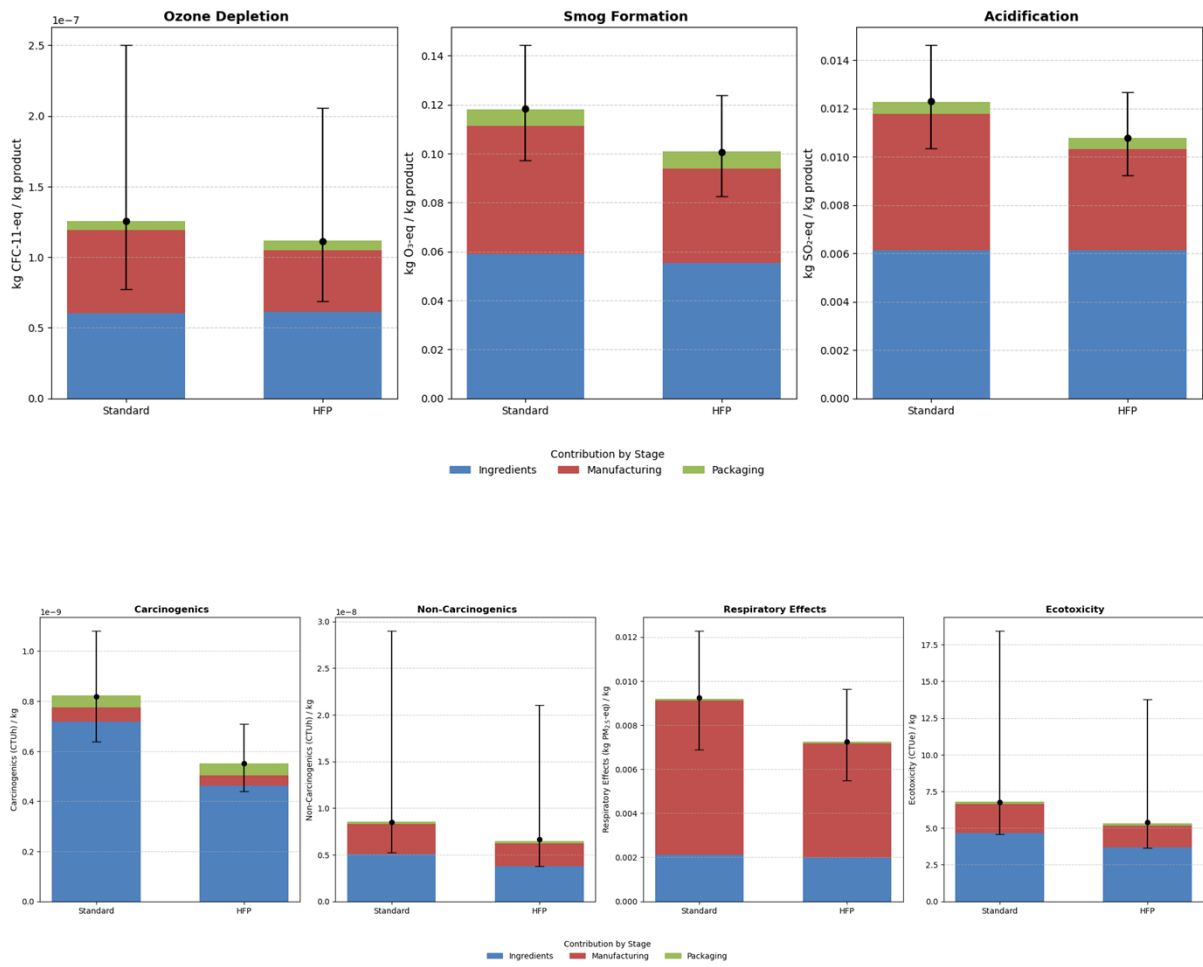
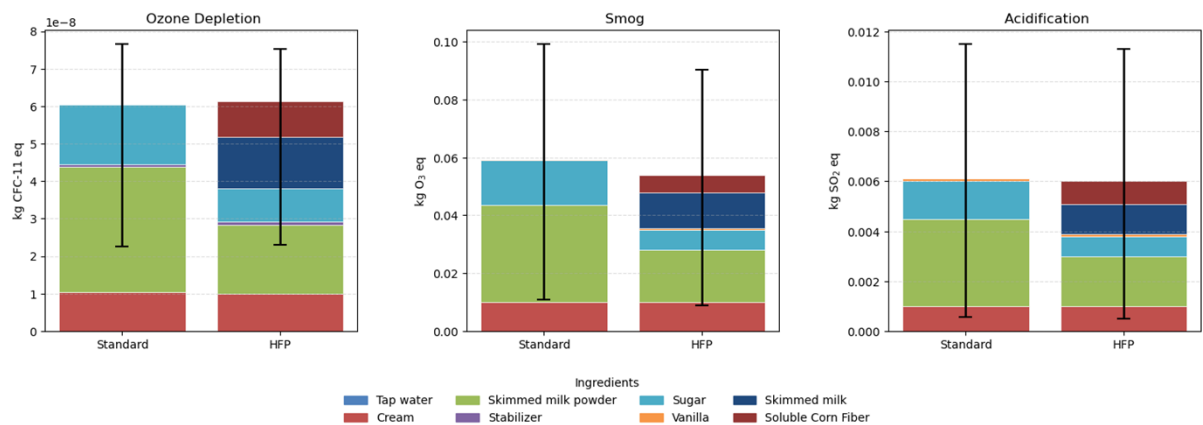


Fig S2. Ingredient-stage contributions to the environmental impacts of standard and HFP ice cream



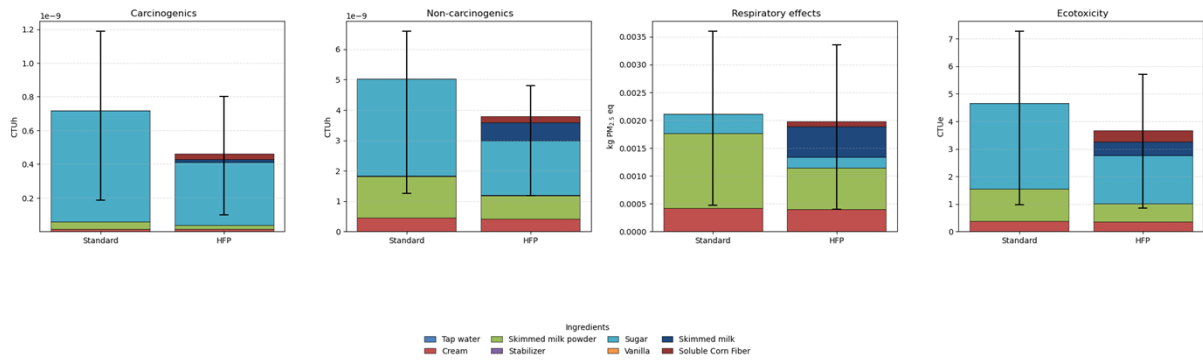


Fig S3. Manufacturing-stage contributions to the environmental impacts of standard and HFP ice cream

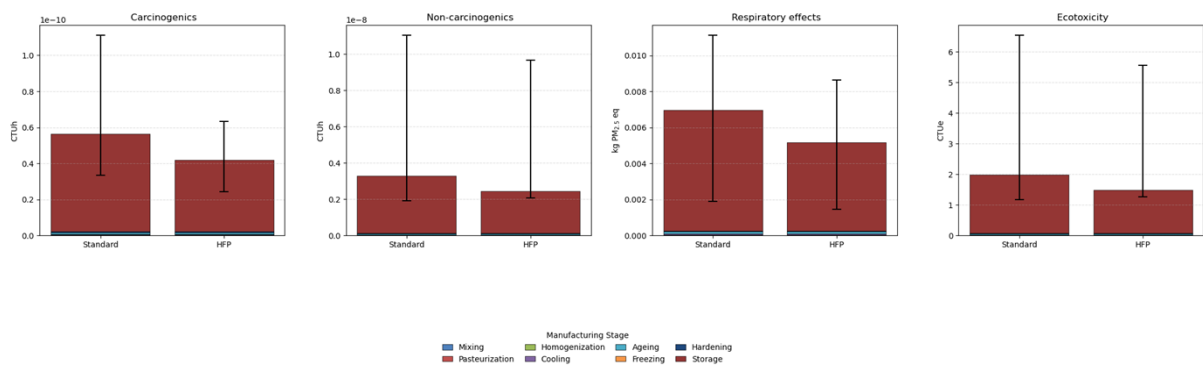
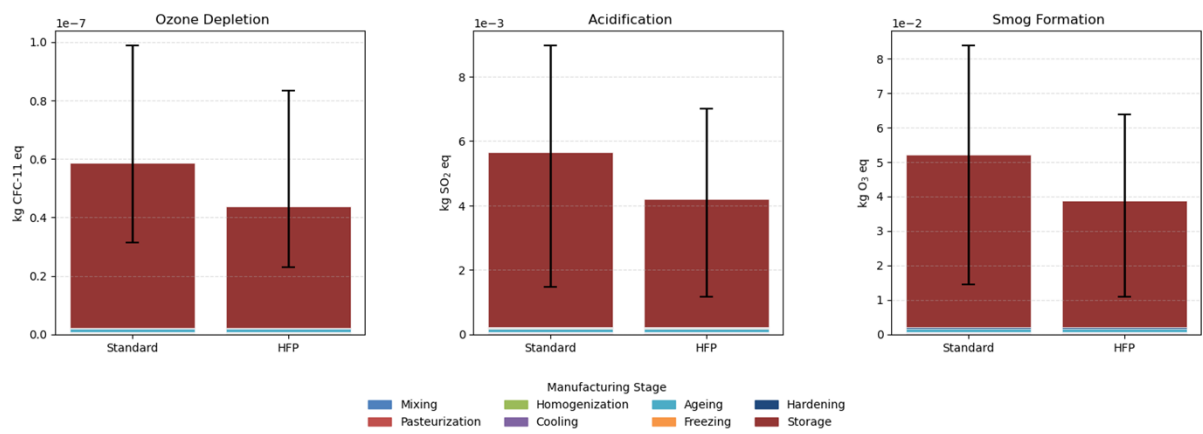


Table S3. Results of uncertainty analysis for Standard mix.

Impact Category	mean	Max	Min
Acidification	0.01228213	0.00235084	0.00193394
Carcinogenics	8.1941E-10	2.621E-10	1.811E-10
Ecotoxicity	6.75770216	11.6945755	2.18768784
Eutrophication	0.02677779	0.04365367	0.01518651
Fossil fuel depletion	1.93451145	0.65407777	0.44134089
Global warming	2.84095739	0.98794149	0.76504596
Non carcinogenics	8.5109E-09	2.0501E-08	3.2488E-09
Ozone depletion	1.2546E-07	1.2493E-07	4.8006E-08
Respiratory effects	0.00923557	0.00304737	0.00234628
Smog	0.11843547	0.02601675	0.02125417

Table S4. Results of uncertainty analysis for HFP mix.

Impact Category	mean	Max	Min
Acidification	0.01077867	0.001889454	0.00153923
Carcinogenics	5.5122E-10	1.57116E-10	1.1141E-10
Ecotoxicity	5.37990556	8.394774598	1.74996544
Eutrophication	0.02159741	0.031992575	0.0112346
Fossil fuel depletion	1.74459483	0.465179696	0.33348113
Global warming	2.42862959	0.720060762	0.57261034
Non carcinogenics	6.6318E-09	1.4374E-08	2.831E-09
Ozone depletion	1.1137E-07	9.42016E-08	4.2813E-08
Respiratory effects	0.0072371	0.002403315	0.001762
Smog	0.10064829	0.023079463	0.01822194