TECHNOTES

Volume 2, Issue 23

COMPANION

SPRAY-DRIED PLASMA FOR WET PETFOOD

The use of Spray-Dried Plasma (SDP) as a superior binder in wet petfood is well recognized and commonly used in the industry. SDP is characterized by its well-balanced technological properties highly appreciated in canned petfood products. Manufacturers can rely on SDP for higher gelling, water retention and emulsion capacities compared to other binders. They are also recognizing that plasma improves the standardization of the quality of the final cooked product by efficiently absorbing quality differences between batches of the meat by-products raw material.

APC conducted a trial with two different raw poultry carcass qualities testing the effect on the technological properties of cooked chunks in gravy. To analyze the properties differences, APC used texture profile analysis (TPA), which has been shown to have a good correlation with the texture of food.

Instrumental TPA was developed about 40 years ago, constituting an interesting way of analyzing several textural parameters in only one assay. Since then, much work has been done and new tools have been developed. TPA via interpretation of stress-strain curves will continue to be extremely useful in evaluating the textural quality of foods, particularly when parameters can be correlated with sensory assessments.

Table 2: Wet petfood recipes

The chunk recipes used in the study comparing a control group

	Control	SDP	WG
Poultry carcass	711.9	691.9	691.9
Wheat flour	70	70	70
Binder protein	-	20	20
Locust bean gum	5	5	5
Common salt	5	5	5
Sodium poly-phosphate	5	5	5
Sodium bicarbonate	2	2	2
Ascorbic acid	1	1	1
Sodium nitrite	0.1	0.1	0.1
Water	200	200	200

THE USE OF SPRAY-DRIED PLASMA CAN IMPROVE WET PETFOODS BY ABSORBING QUALITY DIFFERENCES IN RAW MATERIAL

COMPARISON OF RAW POULTRY CARCASS

	% Solids	% Proteins	% Ashes	Texture (g)	Water losses (g)
Poultry carcass (CL)	36.89	15.51	2.93	503±12	21.9±0.6
Poultry carcass (CH)	41.14	15.05	3.37	601±22*	17.1±0.8*

TPA measures parameters such as hardness, adhesiveness, chewiness, gumminess, cohesiveness, resilience and springiness. These tests quantify the texture of the food and evaluate the consistency of the manufacturing processes.

In this study, two different poultry carcass qualities were received from a Spanish supplier of raw material to different European wet petfood producers. The carcass called CH is considered high-medium quality and the carcass called CL in considered medium low-quality.

As observed, carcass CH had a better texture and lower water losses compared with the carcass CL, indicating that carcass CH had higher quality (Table 1). Both carcasses were used in a standard recipe indicated in Table 2. Two binders, SDP (AP820 from APC Europe) or Wheat Gluten (WG) included at 2% in the recipe were compared to a control diet without a binder.

We prepared cans with chunks of similar size and shape, produced with a special device and included in gravy in a ratio 1:1 between chunks and gravy to measure the TPA parameters. The cans were sterilized in a laboratory autoclave at 121°C for one hour and left for two days to cool to room temperature before performing the analyses.

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With respect to TPA parameters, we found that in general, carcass CH shows better TPA results compared with the carcass CL, indicating that effectively, carcass CH has a higher quality than the CL, as the producer already suggested (Table 3). Independently of the poultry carcass tested, the use of SDP improves all the textural parameters analyzed compared with the other two conditions (control and WG), including hardness of the final chunks (Figure 1).

Regarding the binders ability to reduce quality differences of the two poultry carcasses used, we found significant differences in almost all of the APC parameters from the Control and WG recipes according to the quality of the carcass, but not for the recipe containing SDP (Table 3). Results may be interpreted that SDP is better able to homogenize differences in quality between carcasses.

Suppliers of animal by-products should consider the recommendation of using SDP in wet petfood recipes to avoid daily natural variations in their ingredient raw materials and also to avoid differences in product performance between fresh and frozen meat ingredients. Petfood producers should also consider the addition of a binder, like SDP, that could be regarded as a "safety belt" to warranty similar quality of their wet petfood on a regular basis.

Figure 1: Comparison of hardness (g) in CL carcass and CH carcass with and without SDP

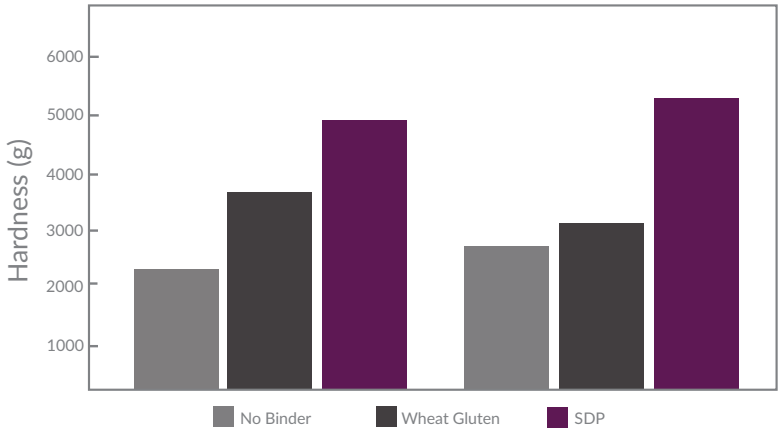

TABLE 3: TPA COMPARISON OF RECIPES WITH AND WITHOUT SDP

Quality Carcass	Hardness (g)	Adhesiveness (g.s)	Springiness mm	Cohesiveness	Chewiness g.mm	Resilience mm
CL Carcass						
No Binder	2477±68.0 ^{a}	156±13.1 ^{cd}	0805±0.008 ^{a}	0.543±0.014 ^{b}	1115±60.9 ^{a}	0.254±0.009 ^{b}
SDP	4912±89.5 ^{d}	-133±15.7 ^{d}	0.874±0.003 ^{c}	0.711±0.002 ^{c}	3061±60.6 ^{d}	0.382±0.002 ^{c}
Wheat Gluten	3366±106 ^{c}	-229±7.06 ^{ab}	0.832±0.005 ^{b}	0.560±0.009 ^{b}	1609±78.0 ^{c}	0.270±0.006 ^{b}
CH Carcass						
No Binder	2992±40.4 ^{b}	-248±15.5 ^{a}	0.837±0.005 ^{b}	0.554±0.010 ^{b}	1400±43.0 ^{b}	0.264±0.006 ^{b}
SDP	5178±87.6 ^{e}	-172±17.6 ^{cd}	0.876±0.003 ^{c}	0.706±0.004 ^{c}	3219±74.2 ^{d}	0.376±0.004 ^{c}

a,b,c Values in the same column with different superscript were significantly different by One-Way ANOVA (P<0.05)

BOTTOM LINE

TEXTURAL PARAMETERS ↑

ABSORPTION DIFFERENCES IN RAW MATERIALS ↑

PRODUCT PERFORMANCE ↑