

Analysis of Assam Tea Processing in Small Scale Factories in the Highlands of Northern Thailand

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Background

Cultivation of local Assam Tea plant varieties in the sensitive highlands of Northern Thailand with processing units on-site as a more sustainable way of land use creating a sufficient income and maintaining natural resources.



Assam Tea plantation and processing in Northern Thailand.

Materials & Methods

Local tea processing factories were observed and samples were collected throughout the processing chain. The collected tea samples were analyzed for moisture content (MC), total polyphenolic content (TPC), total catechin content (TCC), individual catechin composition (ICC) and caffeine content (CF). Involved tea factory owners and tea farmers were interviewed.



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Results and Discussion

Throughout the processing chain the variation of MC increased. Inaccuracy and intuitive management during processing led to increasing standard deviation and coefficient of variance.

TCC and TPC were lower than expected indicating lower quality. After rolling process samples showed higher TCC, TPC and CF.

Table 1. Mean moisture content (g/g), standard deviation (SD) and coefficient of variation (CV) of black tea samples throughout processing at three processing units (PU 1-3).

		Withering	Roasting	Rolling	Oxidation	Dried Tea
PU 1	Mean MC	72.85 b	69.84 b	69.48 b	35.39 a	7.94 a
	SD	4.42	5.17	4.82	30.77	2.09
	CV	0.06	0.07	0.07	0.87	0.26
PU 2	Mean MC	75.84 a	75.10 a	75.07 a	21.66 a	2.76 b
	SD	2.81	3.99	2.91	11.37	1.13
	CV	0.04	0.05	0.04	0.52	0.41
PU 3	Mean MC	75.64 a	70.11 b	67.53 b	28.63 a	4.24 b
	SD	1.23	2.96	1.86	6.20	4.26
	CV	0.02	0.04	0.03	0.22	1.00

Withering, roasting, rolling: n = 72; oxidation and dried tea: n = 36. Values of the same row followed by the same letter are not statistically different (p = 0.05).

Table 2. Mean values of total catechin content (TCC; in g / 100g DM), total polyphenol content (TPC; in Gallic Acid Equivalent g / 100g DM) and caffeine (CF; in g / 100g DM) throughout black tea processing in three processing units in Northern Thailand.

	TCC	TPC	CF
Withering	6.42 ab	16.01 ab	1.50 b
Roasting	6.79 ab	15.08 b	1.48 b
Rolling	7.94 a	16.17 a	1.67 b
Oxidation	6.53 ab	12.51 c	1.67 b
Dried Tea	6.23 b	16.51 a	2.10 a

Withering, roasting, rolling: n = 72; oxidation and dried tea: n = 36. Values of the same column followed by the same letter are not statistically different (p = 0.05).

Conclusions and Outlook

Tea products were of local character as processing steps were implemented based on personal intuition rather than on technology. Production and derived products did not meet international market requirements. Black tea oxidation was inhibited through roasting process. Quality control from tea farmers and processing units was not executed.

In future, adaptation to international manufacturing and product quality standards would improve market access.

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