

European Code of Practice for Basmati Rice Labelling

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What Does Code of Practice Mean?



A code of practice is a written guideline issued by a professional association that lays out ethical standards for a profession, trade, occupation, organization, or union.



Codes of practice do not usually carry the same force as legislation.



Often, they consist of rules crafted in response to actual or potential dangers observed on the job. The Occupational Safety and Health Administration (OSHA), for example, issues codes of practice for various industries in order to encourage safer working conditions.

Code of Practice on Basmati Rice Labelling *Underpinned by Science*



- Food Standards Agency (UK) drafted the original Code of Practice that was adopted by Rice Millers and Retailers in the UK and EU to protect consumers
- Basmati Rice Exporters in India and Pakistan are always consulted
- Dr Katherine Steele, et al, of Bangor University devised the original authenticity DNA fingerprint test
- In Europe, Dr Werner Nader, et al (Eurofins) continues to update the DNA fingerprinting test for newer Basmati varieties

ANALYTICAL TECHNOLOGIES



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The DNA fingerprint in food forensics: the Basmati rice case

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ABSTRACT

Due to its exceptional aroma and cooking characteristics Basmati rice is one of the most popular rice specialties in the EU and the Middle East and is attracting a premium price. In the EU the strict authenticity definitions by the UK Code of Practice on Basmati Rice (CoP) of 2005 contributed significantly to improve the quality of this product and thereby its success on the market. Fifteen varieties were defined as authentic and a DNA fingerprinting method was determined for authenticity testing. Twenty-six new varieties had been released since then by India and Pakistan as Basmati and had to be included in the revised CoP of 2017. This study reports the analysis of the DNA fingerprints of these cultivars from reference materials from official sources to enable the application of the CoP. Results not only allow the enforcement of the revised CoP, but provide further insights into the genetic relationships between the varieties and their descent from common ancestors. The Basmati cultivars of major economic importance can be grouped in four types due to their close relationship: Basmati 370, Kernel/Taraori, Super Basmati and Pusa Basmati 1. The genotype *fgr* is supposedly the major cause of the Basmati aroma and is missing in 6 of the new varieties. Because it is not the only functional polymorphism associated with fragrance of rice the content of aroma in these

Therefore the British Retail Consortium BRC, Rice Association and the British Rice Millers Association issued in 2005 their Code of Practice on Basmati Rice and defined 15 rice varieties as authentic (4). Cultivation is geographically limited to 7 States in Northern India and the Punjab in Pakistan. The CoP defines in its article 6.1 DNA fingerprinting as the standard method to differentiate authentic Basmati from non-Basmati adulterants. Developed by Bligh (5) in 2000 the method has proven its reliability and robustness in practice and in numerous inter-laboratory ring trials and proficiency tests. The CoP has significantly improved the Basmati quality on the EU market. Whereas 13 out of 54 Basmati products were found adulterated in various consumer tests from 2006 to 2010 in Germany and France (6, 7, 8), in two recent German studies (9, 10) only one out of 36 products was not compliant with the CoP.

Since 2005 26 new Basmati varieties were notified in India and Pakistan and many of these are now cultivated at large commercial scale. Consequently the CoP had to be revised in 2017 and now includes all 41 cultivars released as Basmati in the countries of origin (4). In forensics criminals can be only

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Dr. **Werner Nader** is a biologist, 67 years old and was until his retirement the managing director of Eurofins Global Control GmbH in Hamburg. He worked as a postdoctoral fellow at the Massachusetts Institute of Technology, Texas A&M University and Max-Planck-Institute, in the biotech industry until his retirement in food control. Currently he is engaged in various senior consulting activities.



Basmati varieties in the UK Code of Practice, 2005

Variety	Notified by	Year	Breeding background	Ref.
Basmati 370	Rice Research Station Kala Shah Kaku, today Pakistan	1933	Punjab, local selection	11
Kernel (Pakistani Basmati)	Rice Research Station Kala Shah Kaku, Pakistan	1968	Basmati 370 / CM7-6	12, 13
Basmati 217	Punjab Agricultural University, India	1969	Punjab, local selection	11
Basmati 198	Rice Research Station Kala Shah Kaku, Pakistan	1972	Basmati 370 / TN1	14
Type 3 (Dehradun)	Nagina Rice Research Station, Uttar Pradesh, India	1978	Uttar Pradesh, local selection	11
Punjab Basmati (Bauni Basmati)	Punjab Agricultural University, India	1984	Sona / Basmati 370 or TN1 / Basmati 370	15, 16
Basmati 385	Rice Research Station Kala Shah Kaku, Pakistan	1988	TN1 / Basmati 370	11
Pusa Basmati 1 (IET 10364)	Indian Agricultural Research Institute, Delhi, India	1989	Pusa 150 / Karnal local	11
Kasturi (IET 8580)	Indian Institute of Rice Research, Rajendranagar, India	1989	CK 88-17-1-5 / Basmati 370	11
Haryana Basmati (HKR 228/IET 10367)	Haryana Agricultural University, India	1991	Sona / Basmati 370	11
Mahi Suganda	Rajasthan Agricultural University, India	1995	BK 79 / Basmati 370	11
Ranbir Basmati (IET 11348)	Sher-e-Kashmir University, Jammu, India	1996	Jammu, selection from Basmati 370	11
Taraori Bas. (HBC-19, Karnal Local)	Haryana Agricultural University, India	1996	Haryana, local selection	11
Super Basmati	Rice Research Station Kala Shah Kaku, Pakistan	1996	Basmati 370/10486 or Basmati 320/IR661	14, 15
Basmati 386	Punjab Agriculture University, India	1997	Punjab, local selection	11

- Original list of 15 permitted varieties: nine traditional ones that could be imported duty free and a further six that were modern cultivars.

Basmati labelling and the code of practice

Background

- Basmati rice has been cultivated for thousands of years in the fertile alluvial plains between the Indus and Ganges rivers.
- To qualify as basmati, grains must meet certain standards related to things like fragrance, grain length and width, as well as cooked texture. They must also have a mid-range level of amylose, a part of the starch in rice.
- At the request of India & Pakistan a significant number of newly cultivated varieties have been permitted to be labelled Basmati in the UK and EU since 2017, and some have turned out to be sub-standard, lacking the unique 'popcorn-like' fragrance that helps to make this rice so sought after.
- New rules were introduced at the beginning of 2023 that mean these lesser varieties cannot be labelled as Basmati in the European market.

New varieties in the revised UK Code of Practice, 2017

Basmati 2000	Rice Research Station Kala Shah Kaku, Pakistan	2001	Basmati 385 / Super Basmati	12
Shaheen Basmati	Soil Salinity Indistute, Pindi Bhattian, Pakistan	2001	Super Basmati / Basmati 385	12
Improved Pusa Basmati 1 (Pusa 1460)	Indian Agricultural Research Institute, Delhi, India	2007	Pusa Basmati 1 / IRBB55	16
Pusa Basmati 1121	Indian Agricultural Research Institute, Delhi, India	2008	P614-1-2 / P614-2-4-3, lines derived from Basmati 370 and Type 3	25
Vallabh Basmati 22	Sardar Vallabh Bhai Patel University of Agriculture and Technology, Uttar Pradesh, India	2009		
Basmati 515	Rice Research Station Kala Shah Kaku, Pakistan	2009	Three way cross Bas 320/10486/50021	17
Pusa Basmati 6 (Pusa 1401)	Indian Agricultural Research Institute, Pusa, India	2010	Pusa Basmati 1 / 1121	18
Punjab Basmati 2	Punjab Agricultural University, India	2012		
Basmati CSR 30 (Yamini)	ICAR Central Soil Salinity Research Institute, Haryana	2012	Bururatha 4–10 /Pakistani Basmati	11, 16
Vallabh Basmati 21 (IET 19493)	Sardar Vallabh Bhai Patel University	2013		
Malviya Basmati Dhan 10-9 (IET 21669)	Banaras Hindu University, U.P., India	2013		
Pusa Basmati 1509 (IET 21960)	Indian Agricultural Research Institute, Delhi, India	2013	Pusa Basmati 1121 / Pusa 1301	18
Basmati 564	Sher-e-Kashmir University, Jammu, India	2015		
Vallabh Basmati 23	Sardar Vallabh Bhai Patel University	2015		
Vallabh Basmati 24	Sardar Vallabh Bhai Patel University	2015		
Pusa Basmati 1609	Indian Agricultural Research Institute, Delhi, India	2015	elite Basmati restorer line PRR78 / C101A51	19
Pant Basmati 1 (IET 21665)	G. B. Pant University of Agriculture and Technology, Pantnagar, India	2016	Pusa Basmati 1 / IET 12603	20
Pant Basmati 2 (IET 21953)	G. B. Pant University of Agriculture and Technology	2016		
Punjab Basmati 3	Punjab Agriculture University, India	2016	Basmati 386/IET 17948//Basmati 386	21
Pusa Basmati 1637	Indian Agricultural Research Institute, Delhi, India	2016	MAS derived NIL of Pusa Basmati 1	18
Pusa Basmati 1728	Indian Agricultural Research Institute, Delhi, India	2016	MAS derived NIL of Pusa 6	18
NIAB Basmati 2016	Nuclear Institute for Agriculture and Biology, Faisalabad	2016	possibly mutant of Basmati 370, see text	
Noor Basmati	Nuclear Institute for Agriculture and Biology, Pakistan			
Punjab Basmati	Rice Research Station Kala Shah Kaku, Pakistan		possibly sister line of Chenab, see Figure 2	
Chenab Basmati	Rice Research Station Kala Shah Kaku, Pakistan		98PP4 / 4439	22, 23
Kissan Basmati	Rice Research Station Kala Shah Kaku, Pakistan			
PK 386 (non-Basmati and not included in the UK CoP)	Rice Research Station Kala Shah Kaku, Pakistan		4439/1053-1-2	24

Table 1. Varieties of Basmati rice that can use the description 'Basmati'

Varieties of Basmati rice that can use the description 'Basmati'.

Note: the varieties highlighted in yellow below will be removed as not containing the requisite fragrance gene. Rice packed and labelled as basmati after 31.12.2022 must not use these highlighted varieties

Those highlighted in purple have been approved for cultivation since 2017. They are added on the basis that authenticated samples are made available and that the fragrance gene is present

Basmati 198
Basmati 2000
Basmati 217
Basmati 370
Basmati 385
Basmati 386
Basmati 515
Basmati 564
Chenab Basmati
Haryana Basmati (HKR 228/IET 10367)
Improved Pusa Basmati 1 (Pusa 1460)
Kasturi (IE& 8580)
Kernel Basmati (Basmati Pakistan)
Kissan Basmati
Mahi Suganda
Malviya Basmati Dhan
NIAB Basmati 2016
Noor Basmati
Pant Basmati 1
Pant Basmati 2
Punjab Basmati (Bauni Basmati)
Punjab Basmati (Pakistan)
Punjab Basmati 2
Punjab Basmati 3
Pusa 1121
Pusa 1509
Pusa 1609
Pusa 1637
Pusa 1728
Pusa 6 (Pusa 1401)
Pusa Basmati (IET 10364)
Ranbir Basmati (IET 11348)
Pusa Basmati 1
Shaheen Basmati
Super Basmati
Taraori Basmati (HBC-19, Karnal Local) Kasturi (IET 8580)
Type – 3 (Dehradun)
Vallabh Basmati 21
Vallabh Basmati 22
Vallabh Basmati 23

Vallabh Basmati 24
Yamini (CSR 30)
Pusa Basmati 1718
Punjab Basmati 4
Punjab Basmati 5
Haryana Basmati 2
Pusa Basmati 1692

- *“India and Pakistan had successfully persuaded the UK and EU that these 25 new varieties were as high in quality as the existing 16, but **several years later we were able to show that this wasn’t entirely right.***
- *By developing alternative DNA markers for fingerprinting, scientists showed that six of the new varieties – five from India and one from Pakistan – had **not been properly bred for fragrance.***
- *Some did not even contain the version of the BADH2 gene that makes basmati fragrance possible in the first place. **Although India and Pakistan have rigorous systems for testing rice quality, they don’t necessarily do the gene testing that would have picked up the problem.”***

- Dr Katherine Steele

In 2022 the Code was amended, removing 6 varieties and adding 5 new varieties that do meet the criteria above (Table 2)

Table 2. Minimum characteristics for varieties of Basmati rice when milled, raw

Minimum elongation ratio on cooking	1.7
Minimum average pre-cooked length	6.5 mm
Amylose content	Intermediate 19-26%
Length/breadth ratio	greater than 3.5
Gel Length	60-100 mm
Alkali spreading value	4-5
Typical Basmati Aroma	Present

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- It is already **agreed by the traders and business partners** involved
- It is **enforceable as tests** can discern objectively what is and is not in compliance
- It is **flexible should there be further innovation** in relation to basmati production in India and Pakistan
- It is not a PGI and therefore **avoids potential conflicts between regulators in the countries of origin**
- It is consistent with how the market already operates and **protects the interests of European consumers by** providing clarity about what is and is not basmati

Conclusion

- The Proposal for a Protected Geographical Indication (PGI) status for Indian Basmati would create confusion in the European marketplace
 - **What would be the legal status of Basmati from Pakistan** that does not have a PGI?
 - **What would be the status of the 6 varieties** that do not meet the criteria for Basmati agreed with India & Pakistan under the Code? They cannot now be labelled as Basmati in Europe
 - Would the Commission need to amend its list of Basmati rice varieties eligible for brown rice zero duty?
- A PGI to India and/or to Pakistan, in general, would damage EU Rice Industry without giving any additional guarantee to consumers
- It could boost import of packed rice from India/Pakistan, with less quality controls for consumers
- FERM supports the use of the European Code of Practice as a comprehensive tool to safeguard the interest of the Indian and Pakistani traders, as well as the interest of the EU consumers, while preventing any disruptions that will damage the European Rice Millers.

Thank you

References:

Basmati rice: the new authenticity rules aiming to remove sub-standard varieties from the market, Dr Katherine Steele, Senior Lecturer in Sustainable Crop Production, Bangor University.

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The DNA Fingerprint In Food Forensics: The Basmati Rice Case, Werner Nader*, Jennifer Elsner**, Torsten Brendel**, Rainer Schubbert*,

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