

## Odor origin of fresh and processed truffles



Label on a processed truffle packaging. Credit: Konzum d.d. Tartufata 80g Zigante: <https://www.konzum.hr/web/products/tartufata-80-g-zigante> (accessed 25 November 2019).

### Keywords

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### NWFP

Wild Mushrooms & Truffles

### Scale

National



### Context

Odor composition of fresh black truffles (*Tuber melanosporum* and *T. aestivum*) mainly consists of ethanol ( $C_2H_5OH$ ) and thiobismethane ( $C_2H_6S$ ). Lately, a lot of half-processed/refined black truffles and truffle oils that can be found on grocery store shelves consist, among other substances, of 1% fresh truffles and truffle aromas. That truffle aroma is actually the odor made artificially from petroleum – 2,4-dithiapentane or bis(methylthio)methane ( $C_3H_8S_2$ ). 2,4-dithiapentane is a volatile component of white truffle, some cheeses, milk, fish oils, shitake mushroom,s prawns and lobsters. In low quantities does not have an effect on human body.



### Objective

With the fluctuation of truffle market, the prices of truffles for restaurants and/or for end consumers can be very variable. This implies the use of less expensive truffle based additions, such as truffle oils and tartufatas (mixture of mushrooms and truffle, used as side dishes, or as a main ingredient for truffle based pates and sauces). Since the odor of fresh truffles are volatile and more mild than their replacements (truffle oils), the objective of this text is to educate the end consumer on differences between the raw truffle material and processed ingredients found in grocery stores.



## Results

Because of their volatility and chemical instability, the odor compounds from truffles is hard to fixate in vegetable oil only by extraction. This is the reason why small quantities of synthetic 2,4-dithiapentane are added to the vegetable oil. It is interesting that 2,4-dithiapentane, that satisfies the 'food grade' of regulations on dietary supplements can be acquired from special wholesalers at the price of 770 U.S. dollars per kilo, while the same supplement without 'food grade' can be acquired at prices 10 times lower. Having in my mind that very small quantities of 2,4-dithiapentane are added to the vegetable oil, it is clear that truffle oil producers can achieve large profits.



## Recommendations

Istrian region in Croatia is well known for its truffles found in nature, both white and black, from which the most abundant are *Tuber magnatum*, *T. borchii*, *T. aestivum* and *T. brumale*. During the autumn and winter months the most wanted food ingredient on food festivals and restaurants are actually truffles. While serving the dishes made with fresh truffles, they are usually added to dish by grating them in front of the customer. While the first sensor, the visual one, is satisfied, the second one, olfactory, suggests this is not the fresh one, since the olfactory sensor is used to hard-smelling processed/packaged truffle substitutes. To avoid such inconveniences in gastronomic offer, it is needed to raise the awareness of food substances among the consumers through education, direct or indirect, on food ingredients, using the well developed and popular food festivals.



## Impacts and weaknesses

It is a legal obligation for food manufacturers and processors to analyze the content of packaged food in certified laboratories and to state the packaging content onto a label (declaration). While some additives are stated in form of a code (i.e. E 1105) the others are named just as 'flavors'. If the flavor additives are 'food-graded', is it not important to define them on a label? If not, why are all other food ingredients named? In order to change this, legislations on national level should be changed, which will impact all products, not only food, thus leading to additional costs for manufacturers with the possible impact of higher end product prices.



## Future developments

If we tend to avoid complex legal adjustments that might result in changes of analysis methods of a big variety of products, constant education of end consumers is needed. In the case of truffle flavor, producers should be open to stating the origin of flavors, by explaining the differences in volatility of fresh truffle odor. End consumers should be aware of food ingredients they are consuming. Possible solution is the declaration of organic products, which will have less odor but will result in better taste. By differentiating the organic products and by having a bigger variety of products, negative impacts on sell income could be avoided, since the costs of organic food production is also lower.



Label on a truffle oil packaging. Credit: Index.hr. Industrija tartufa je golema prevara? Ulja i tartufate veze nemaju s tartufima: <https://www.index.hr/vijesti/clanak/industrija-tartufa-je-golema-prevara...> (accessed 25 November 2019).

## Further information

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### About INCREDIBLE Project

INCREDIBLE project aims to show how Non-Wood Forest Products (NWFP) can play an important role in supporting sustainable forest management and rural development, by creating networks to share and exchange knowledge and expertise. 'Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin' (INCREDIBLE) promotes cross-sectoral collaboration and innovation to highlight the value and potential of NWFPs in the region.

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