Sensorial evaluation of AOC food products: an empirical approach situated within a professional environment

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Contribution appeared in Sylvander, B., Barjolle, D. and Arfini, F. (1999) (Eds.) "The Socio-Economics of Origin Labelled Products: Spatial, Institutional and Co-ordination Aspects", proceedings of the 67th EAAE Seminar, pp. 256 - 267

October 28-30, 1999

Le Mans, France

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Abstract

Sensorial characterisation is extremely valuable for products benefiting from "AOC" status. However, the methods generally used for officially guaranteed food products are poorly adapted to "AOC" products. This is because products belonging to the same "AOC" are inevitably highly variable. The characterisation of these products cannot therefore be limited to a single sensorial profile but rather requires the construction of several different profiles. This does not in anyway question the validity of the "AOC" designation. Paradoxically, the small volume produced of many AOC products prevents the construction of these sensory profiles for economic reasons.

In this article, the authors describe how the current empirical approach works, using the example of cheese products. This approach is based on a simple sensorial method involving the professional sector. The authors also consider how this approach may be validated and improved.

Keywords : AOC, terroir, agreement, variability, sensory analysis, methodology, vocabulary

INTRODUCTION

The law of the 6th of May 1919 stipulates that "*an Apellation d'Origine Contrôlée constitutes the naming of a country, a region or a locality as designating the origin of a product of which the qualities or the characteristics are due to the geographical environment including natural and human factors.*"

The law of the 2nd of July 1990 made INAO[1] responsible for the recognition according to a specified procedure of all primary and derived agricultural and food products seeking the *AOC*[2] designation, as well as for the definition of the conditions for their production and approval. In practice, the conditions of production taken into account are extremely diverse. In addition to the area of production, they include all those factors that are liable to confer on the product particular characteristics relating to the *terroir*. At the conclusion of the first international conference on wine *terroirs*, the OIV[3] decided that this word had not to be translated. Salette (1998) defined the term as "*a system of complex interactions between a collection of human actions and techniques, a farming system and a physical environment, vindicated by a product on which it confers a particular originality*".

The approval procedure generally occurs in two distinct stages, a stage to verify the production methods (verification of the production conditions and identification of farmers or manufacturers) and a second stage to verify the quality of the product by means of analytical and organoleptic tests. The aim of these tests is to ensure that the products benefiting from an *AOC* label possess particular characteristics that are clearly detectable despite intrinsic variability. The *AOC* is, in effect, a collective property that is shared among the participants involved in production. The diversity of the raw materials (deriving from numerous units of the same basic *terroir*, if one accepts the concept proposed by Morlat (1998)) and of the methods of transformation (each producer is, to a certain extent, his own master of the process for obtaining the end product), lead to an undeniable and desirable variability in *AOC* products. Monnet and Gaiffe (1998) describe the chain of factors leading to the production of the cheese *AOC Comté* : "*A geographical area, characterised by a climate, a geology and a soil layer supports a semi-natural prairie vegetation subject to agricultural practices. This vegetation nourishes sheep of the Montbéliarde race which have been strongly selected for milk production. The milk, while conserving its natural integrity, is subsequently the object of various manipulations before providing a cheese that undergoes a long maturation to intensify the taste*". The authors add "*It goes without saying that given such a long and complex chain, the taste cannot be uniform*". An example of this variability was presented by Clément during the last ANAOF[4] conference on the 10th and 11th of June 1999 concerning 100 cheeses of the same *AOC* designation (unfortunately not indicated !).

The description of an *AOC* product therefore cannot not limit itself to a single sensorial profile, but requires the construction of several profiles without this casting any doubt on the eligibility of the *AOC* system. Paradoxically, the construction of these sensorial profiles is often economically impossible for *AOC* products because of the low volume and in particular the variability that results from the production conditions. *AOC* products are not the result of normalised industrial processes. To resolve this dilemma, the approval procedure allows organoleptic quality to be determined by tasting panels composed of professionals representing the different groups involved in production who have an interest in conserving the specific character of their product. Consumers are also sometimes associated with these tasting panels.

The object of this article is to show, by using concrete examples, how this procedure actually functions and to discuss improvements that could be made.

1. THE CURRENT SYSTEM OF EVALUATION IN THE CASE OF *AOC* CHEESES

The choice of case studies is explained by the importance of the cheese sector in the *AOC* system. At the end of 1999, milk products accounted for 39 *AOC* designations, compared to 18 *AOC* designations of other agricultural or food products (table 1). Three examples will be described : two concern soft, washed rind cheeses (*AOC Langres* and *AOC Mont d'Or*) and the third a goat's cheese (*AOC St. Maure de Touraine*).

Table 1 : Products designated as *Appellation d'Origine Contrôlée* (July 1999)

MILK PRODUCTS	
Cow's milk	
Beaufort	Abondance
Bleu de Gex or Bleu du Haut Jura or Bleu de Septmoncel	Bleu d'Auvergne
Bleu du Vercors Sassenage	Bleu des Causses
Brie de Melun	Brie de Meaux
Cantal or Fourme du Cantal	Camembert de Normandie
Comte	Chaource
Fourme d'Ambert or Fourme de Montbrison	Epoisses
Langres	Laguiole
Maroilles or Marolles	Livarot
Munster or Munster-Géromé	Mont d'or or Vacherin du Haut-Doubs
Pont l'Evêque	Neufchatel
Saint Nectaire	Reblochon or Reblochon de Savoie
	Salers
Goat's milk	
Crottin de Chavignol ou Chavignol	Chabichou du Poitou
Pouligny St Pierre	Picodon de la Drôme or de l'Ardèche
Selles sur Cher	Rocamadour
Valencay	Ste Maure de Touraine
Sheep's milk	**Sheep's and/or Goat's milk**
Roquefort	Brocciu Corse ou Brocciu
Ossau Iraty	
Butters and Cremes	
Beurre Charentes-Poitou or Beurre des Charentes or	Beurre d'Isigny
Beurre des deux-Sèvres	Crème d'Isigny
OTHER PRODUCTS	
Olives	**Other fruit & vegetables**
Olives noires de Nyons	Pomme de terre de l'Ile de Ré
Huile d'olives de Nyons	Coco de Paimpol
Olives noires de la Vallée des Baux de Provence	Lentille verte du Puy
Huiles d'olive de la Vallée des Baux de Provence	
Olives cassées de la Vallée des Baux de Provence	
Grapes	**Meat and Poultry**
Muscat du Ventoux	Taureau de Camargue
Chasselas de Moissac	Volaille de Bresse
	Dinde de Bresse
Walnuts	
Noix de Grenoble	**Other agricultural products**
	Huile Essentielle de Lavande de Haute-Provence
Honey	Foin de Crau
Miel de Sapin des Vosges	
Miel de Corse - Mele di Corsica	

1.1. Underlying principals

The sensorial examination is defined by statutory texts and varies according to the type of product. The objectives of this is twofold : to eliminate non-conforming products and to better characterise the appellation (in particular the variability of products conforming to the appellation).

Sampling is carried out either directly by INAO or by designated representatives. Representative samples are taken from a batch corresponding to a defined period of production. The sampling generally occurs after a minimum period of maturation defined by the *AOC* decree. The transportation and storage of the samples follows defined procedures to ensure optimal conditions of conservation, or evolution, of the *AOC* product.

Tasting takes place in the following way. Whole cheeses are initially presented for visual and olfactory inspection. They are then cut into portions (*e.g.* quarters or halves) so that properties such as the colour and texture of the cheese can be inspected. The judges subsequently assess the taste. The anonymity of the samples is ensured by the representatives of INAO, as are the correct conditions of assessment (*e.g.* silence, correct marking and notation).

Ideally, two institutions (both of which are appointed by INAO) are invited to participate in determining the future of the evaluated product, namely the Product Approval Commission and the College of Experts.

1.1.1. The Product Approval Commission

Presided by a suitably qualified professional producer or manufacturer, the commission is composed of between 5 and 20 members among which are included producers, manufacturers (*e.g.* dairy managers and cheesemakers), maturation warehouse managers and sometimes consumers. This body has the responsibility of announcing sanctions of which there are two types :

- Warning : this sanction is triggered by a mark that falls below the prescribed limit according to the marking scheme. It constitutes an "alert" and leads to a correction procedure consisting of a visit by an *AOC* Professional Commission charged with determining the reasons for the problem and proposing an action-plan. Generally, a new sensorial examination is carried out after a short delay.
- Suspension : can be announced after two consecutive warnings. A suspension forbids the producer or manufacturer concerned from using the *AOC* label for his products. This "suspension of production" is maintained until reversed by a new decision of the Product Approval Commission.

In the majority of cases, the Product Approval Commission itself carries out the assessment of products. It may, however, carry out this function in co-operation with a "college of experts" or alternatively fully delegate this function to the latter body.

1.1.2. The "College of Experts"

Unlike the Product Approval Commission, this body consists of trained assessors. The college does not make any decisions and its role is limited to proposing results to the Product Approval Commission.

The anonymity of all work is required, whether it is undertaken by the Product Approval Commission or the College of Experts. Sanctions are conveyed to those concerned by the services of INAO who, once the work of the Product Approval Commission is completed, lift the requirement for anonymity.

1.2. The example of *AOC Langres* (decree of the 14th of May 1991)

Langres cheese is described as a *soft, salty cheese, white to clear beige in colour with a washed rind of which the colour after maturing varies from clear yellow to brown, a cylindrical form with a hollow in the upper part.* The annual production is of the order of 300 tonnes (with a variation of + or - 15 tonnes).

The samples are collected two weeks before assessment, from at least 21 days production for large-format cheeses and from at least 15 days production for small-format cheeses. Samples are conserved according to the customary practices by INAO for two weeks before being submitted for assessment. Sampling takes place before the maturation is completed and so the conservation must ensure that the cheese reaches a maturity that allows the potential of the product to be

fully appreciated by the assessors. At least 8 assessors note the form and aspect on a 5-point scale, the texture and body of the cheese on a 5-point scale and the overall flavour-odour-taste on a 10-point scale by means of a precise checklist of characteristics that are penalised (see table 2).

Table 2 : Checklist used in the assessment of *AOC Langres* cheese

Form and appearance of the whole cheese

Minimum required : 2 *Maximum : 5*

Desired characteristics	Defaults	Penalty
Cavity depth of at least 5 mm	- Insufficient	-1
	- Absent	-5
Smooth or slightly wrinkled rind	- Cracked rind	-0,5
	- Skin heavily pock-marked	-1
	- Skin detachable	-1
	- Excessively sticky	-1
Cylindrical, slightly truncated shape	Deformed	-1
Uniform golden-yellow to red-brown colour	- Lack of colour	-1
	- Abnormal colour (yellow)	-1
	- Abnormal stains*	

** the presence of "white" is not a fault*

Texture and appearance of the cut cheese

Minimum required : 2 Maximum : 5

Desired characteristics	Defaults	Penalty
Appearance on cutting	Presence of moulding-holes	-0,5
	Presence of fermentation holes	-0,5
	Liquefaction	
	slight	-1
	significantly runny	-3
Mouth-feel / Texture of the cheese body	Hard, dry centre	-1
	Granular	-1 -2
	Dense and rubbery	-1 -2
	Wet	-1
	Sticky	-1

Odour - Taste

Minimum required : 6 Maximum : 10

Desired characteristics	Defaults	Penalty
Presence of a characteristic non-disagreeable odour and flavour	Strong smell of alcohol or of silage resulting from unstable fermentations	-2
	Strong smell of ammonia	-3
	Strong, abnormal smell (medical, smoky, detergent or stable-like odours)	-4
	Lack of odour	-1
Pleasant, characteristic taste	Bland	-1 -4
	Lack of character	
	Sweet or sugary	-1
	Acid	-1 -2
	Bitter	-1 -4
	Abnormal tastes (potato or cabbage-like, musty, stale or pharmaceutical)	-2 -4
	Salty	-1 à -2
	Hot-spicy	-1 à -2

For a product to be declared as non-compliant, it must either receive less than the minimum mark for one of the three groups of characteristics or it must obtain a total mark of less than 12. Table 3 shows, year by year, the results of assessments. On average, one sample in eight was declared as not conforming to the appellation and, in 1994, one manufacturer was suspended.

Table 3 : Results of the control of *AOC Langres* cheese

	1992	1993	1994	1995	1996	1997	1998
Number of assessments	2	4	4	3	4	4	4
Number of samples	14	30	36	27	36	36	33
Number of 1st warnings	1	1	4	3	3	3	8
Number of 2nd warnings			2		1	1	
Number of suspensions			1				

1.3 The example of *AOC Mont d'Or* (decree of the 29th of December 1986)

Mont d'Or or *Vacherin du Haut-Doubs* is a seasonal cheese produced in a region of high altitude and marketed between the 10th of September and the 10th of May. It is described as *a raw, slightly pressed soft-cheese, of a creamy consistency, slightly salty, white to ivory in colour with a washed, slightly polished, yellow to light-brown coloured rind.* Production has increased regularly since 1991, rising from 950 tonnes in 1991/1992 to 3187 tonnes in 1997/1998, being an annual increase of about 370 tonnes.

Samples are taken from batches at least 21 days old. The assessment is carried out by a group of at least 8 people, seventy-two hours or more after sampling. Each product receives a mark according to the scale indicated in table 4.

The cheeses failing to obtain a minimum of 12 marks out of 20 according to this scale are excluded from the *AOC*. Whatever the total mark obtained, cheeses are also considered not to conform to *AOC* requirements for the following reasons :

- A mark of zero for any of the criteria .
- A mark of less than 5 for the taste .
- A pronounced bitter, rancid or hot-spicy taste .
- A chalky centre or texture.

Table 4 : Checklist used for assessing *AOC Mont d'Or* cheese

Top mark	Criteria	Optimum
10	Taste	Clearly characteristic of *Mont d'Or*
5	Interior texture and appearance	Homogenous colour and ripeness, slightly runny, not sticky, not filled with holes.
3	Smell (before cutting)	Clearly characteristic of Mont d'Or (with a distinctive note of pine)
2	Surface appearance	A folded, washed and slightly polished rind, light-yellow to golden in colour and not very thick. Regular shape. Clean packaging.

Being a seasonal cheese, the results given in table 5 are presented for each marketing season rather than by year. On average, 10% of the products presented have been declared as not conforming to the *AOC*, but no suspension has ever been announced. Since 1996, the reasons for warnings have been collated, but as the number of warnings has been very low for the past three seasons (with no warning given in the most recent season) their analysis is of little interest.

Table 5 : Control and results for the cheese *AOC Mont d'Or*

Season	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99
Number of tastings	4	6	5	3	4	4
Number of samples	63	90	70	44	52	44
Number of 1st warnings	7	8	12	1	3	0
Number of 2nd warnings	2	1	2	-	-	0
Suspensions	0	0	0	0	-	0

1.4. *AOC Saint Maure de Touraine* (decree of the 29th of June 1990)

The cheese *AOC St. Maure* is a soft-cheese with a polished, ash-covered rind in the shape of a elongated, truncated log... *the cheese cuts cleanly with a white or ivory interior and a fine, homogenous texture*. Maturation is carried out for a minimum of 10 days. Production was 369 tonnes in 1992, rising to 950 tonnes in 1998, with a marked growth between 1992 and 1994 when production more or less doubled.

Sampling occurs after the minimum period of maturation. The assessment is carried out by a panel of at least nine people, three days or more after sampling.

The scaled checklist is shown in table 6.

A cheese is declared as non-compliant if the total mark is less than 12 and/or if a partial mark of less than half of the maximum is received.

Table 6 : Scaled checklist used for assessing the cheese *AOC St. Maure de Touraine*

External appearance : out of 5	Appearance on cutting : out of 5	Odour - Taste : out of 10
Desired qualities		
- regular, elongated, truncated shape - superficial moulds	- ivory white - clean, smooth - intact skin	- balanced - distinctive - characteristic
Principal defaults		
- cylindrical - without a wrapping - pock-marked skin - atypical colour	- swelling holes - humid or damp appearance - runny beneath skin	- excessively salty, acid or bitter - rancid, musty or soapy, - hot-spicy or too neutral

The results are given in table 7 which shows the high number of products submitted for approval and the high level of non-conforming products (26% on average). The reasons for refusal can be placed into three catego-ries :

- Reasons related to the external appearance of the cheese, such as a lack of or irregular wrapping, a raw appearance, pock-marked skin, an irregular ash layer, flattened form, the presence of certain types of surface mould or traces of *Penicillium Roqueforti* or *Cyclopium* ;
- Reasons relating to the appearance of the cut cheese, such as holes due to yeast or coliform bacteria, moulding holes, a granular, woolly, crumbly or brittle texture or runniness beneath the rind ;
- Reasons relating to the taste or odour including excessive acidity, saltiness or bitterness, a hot-spicy taste, a rancid, neutral or bland taste, a lack of saltiness, unsuitable smells relating to the surroundings, a smell of garlic or smokiness.

Table 7 : Results and control of the cheese *AOC St. Maure de Touraine*

	1992	1993	1994	1995	1996	1997	1998
Number of tastings	10	12	12	12	11	12	10
Number of samples	153	152	156	153	149	128	108
Number of 1st warnings	40	45	35	23	30	39	26
Number of 2nd warnings	1	3	8	5	4	5	1
Suspensions	0	1	1	0	0	0	0

2. DISCUSSION

2.1. The current system works

This conclusion is evident from the fact that at each meeting certain products are refused while others are accepted. In addition, the system :

- Assures the characteristics of the appellation are conserved : firstly, upon the submission of a demand, the participants agree among themselves on the choice of sensorial characteristics for judging the rapport between the appellation and a particular product. Secondly, the tasting sessions (and discussions of the Product Approval Commission) allow a dialogue among the participants which often leads to a reappraisal of the procedures of production and manufacture. There is continual debate therefore on the quality criteria that define the appellation and the conditions for achieving them.
- Guarantees the transparency of procedures : including those of sampling, assessment and work of the Product Approval Commission. The empirical nature of the *AOC* assessment methodology does not imply that this approach does not follow precise guidelines. One of the tasks of the INAO is to ensure this transparency.

2.2. The system works similarly for other products

Two examples will be examined, the first concerning poultry (*Volaille de Bresse*) and the second black olives (*Olives noires de Nyons*).

2.2.1. AOC Volaille de Bresse

This *Appellation d'Origine Contrôlée* was recognised by the law of the 1st of August 1957. The application decree of the 4th January 1995 specifies that *AOC* poultry must be meaty with well-developed breast filets ; that the skin must be clean and without any quill fragments, tears, bruising or abnormal coloration ; that fattening must render the ridge of the breastbone invisible and that the natural shape of the breastbone is not be modified. In addition the limbs must be free of fractures.

Table 8 : Criteria of *AOC Volaille de Bresse*

The lack of any single criteria leads to declassification.

Descriptors	Glossary
Race	Plumage : perfect, white Feet : blue or bluish Skin : fine, pearly white or slightly creamy (not yellow)
Physique	Body : dense with a high muscle content Fat : harmoniously distributed, without a "carapace" of fat. Dorsal ridge : more or less invisible
Minimum hung, dead-weight	1,2 kg - Chickens 1,8 kg - Poulardes 3,0 kg - Capons
Method of slaughtering	Perfectly bled and no abnormal coloration (*) Absence of bruising, tears and fractures Presence of a ruff a third longer than the neck Well-plucked without any remains of feathers Well gutted and hung

(*) Poor bleeding results in a dark colouring of the head (comb and wattle), blotches on the wings and sub-cutaneous haematoma on the rump.

Declassification may be announced on two levels : declassification of the farmer (during the taking of poultry for slaughter) or of the slaughterer (during cleaning and before affixing seals and labels). If the declassification occurs during transportation, only the identity ring of the bird is taken. If declassification occurs after slaughtering, the *AOC* markers (ring, seal and label) are not attached. In both cases, the opinion of the slaughterer is critical in the decision, the only difference between the two cases being the admission and refusal criteria and the presence or absence of the poultry farmer. Generally the poultry farmer is present when the refusal occurs during the taking of poultry to slaughter while he is absent when the refusal occurs at the abat-toir. Once informed, the poultry farmer has the right to appeal.

INAO possesses statistics of the number of birds ringed and the number declassified for the period 1989-1998. The annual number of birds ringed varies between 1 50 000 and 1 250 000. The average percentage declassified is of the order of 14% with an annual variation of about 3% since 1991.

2.2.2. AOC Olives noires de Nyons

In 1999, evaluation was carried out using the checklist given in table 9. The assessors note on a scale of 1 to 5 a certain number of visual, olfactory, flavour and physical characteristics. A general appreciation mark is also required. This checklist replaces the previous much simpler list which stipulated that all samples for which the marks were less than the average led to either a warning or the refusal of the batch. In the new scheme, the median mark serves as a reference and any marks inferior to this median score lead to a warning or rejection of the batch.

Table 9 : Olives

Assessment sheet for table olives (AOC Olives de Nyons)

Appearance		Comments (defaults, qualities)
Batch Homogeneity : low 1 2 3 4 5 high		
Fruit		
colour-hue	.....	
shininess	.....	
shape	.....	
calibre	.....	
peduncle	.....	
skin appearance	.....	
flesh appearance	.....	
Stone		
shape	.....	
colour	.....	
Odour		
Intensity	weak 1 2 3 4 5 strong	
Quality	weak 1 2 3 4 5 strong	
Type	.....	
Texture		
Batch Homogeneity	low 1 2 3 4 5 high	
Adhesion flesh/stone	low 1 2 3 4 5 high	
Proportion flesh/stone	low 1 2 3 4 5 high	
Firmness	soft 1 2 3 4 5 firm	
Fibrous	low 1 2 3 4 5 high	
Juiciness	low 1 2 3 4 5 high	
Smoothness	low 1 2 3 4 5 high	
Oil (fat) content	low 1 2 3 4 5 high	
Flavour		
Batch Homogeneity	low 1 2 3 4 5 high	
Bitterness	low 1 2 3 4 5 high	
Acid	low 1 2 3 4 5 high	
Pungency	low 1 2 3 4 5 high	
Astringency	low 1 2 3 4 5 high	
Saltiness	low 1 2 3 4 5 high	
Sweetness	low 1 2 3 4 5 high	
Aromas		
Intensity	low 1 2 3 4 5 high	
Quality	low 1 2 3 4 5 high	
Persistence	low 1 2 3 4 5 high	
Type	low 1 2 3 4 5 high	
General Appreciation		
Poor 1 2 3 4 5 Very good		

2.3. The system can be improved

2.3.1. Sensory assessment : a recent addition to the AOC system

The setting up of organoleptic controls for *AOC* products is a recent development. The *AOC* concept was recognised in wine production in 1935 (law decree of the 30th of July 1935), but the verification of wine quality, with the aim of determining a marketable volume that met consumer demands, only began in 1960 to be generally adopted in 1979.

Other *AOC* products are for the most part posterior to this date. For those *AOC* defined before this date, the procedure of approval was only set up later during the 1980's. The relatively simple methods and criteria that were established have only very recently been subject to more careful study.

As the *AOC* system was initiated within the professional sector, their texts have since the beginning mainly defined those properties able to demonstrate the relationship of the product to its *terroir* and that are also relatively easily to quantify. The example of the *Volaille de Bresse* is in this regard particularly telling, with the only organoleptic appraisal carried out in 1999 being visual. Neither the flavour nor the texture are the object of a control after cooking.

2.3.2. Anonymity

One of the golden rules of sensorial evaluation is the anonymity of samples. We have already seen how this anonymity is under the control of INAO. As the tasting panel is formed of professional members, this anonymity is easy to achieve when the number of producers is high, as for example in the case of *Crottin de Chavignol*. In this case INAO is convoked only during the evaluation session of producers who do not present samples at the Commission meeting. However, when there are few producers, as in the case of the cheese Epoisses, anonymity is less easily ensured. The same producer should not at the same time be both judge and supplicant.

2.3.3. The monitoring of conforming AOC products

Currently, the system functions more or less satisfactorily for those products judged as non-compliant. It is also necessary, however, to monitor the quality of products that are initially judged as conforming to the *AOC*. As indicated in paragraph 2.1, this is one of the objectives of the sensorial evaluation. The *AOC* appellation aims to supply the consumer, who is purchasing the product for its organoleptic characteristics, a certain guarantee of product character. The initial concern of producers was to prevent defective products from reaching the market, which led to a negative selection procedure based on the conception of "minimum criteria or methods". These minimum conditions having been assured, the professionals need to fine tune their methods of examination and approval. They also need to develop a more precise vocabulary allowing the expression of the organoleptic characteristics of each product. These improvements have a twin objective : better production and better communication.

Unfortunately product description is no easy task (Sauvageot, 1998, Hossenlopp 1995 a and b) and therefore expensive. Certain appellations such as *AOC Comté* have begun this work (Bérodier *et al.*, 1997, Stévenot *et al.*, 1997). Very often the approach is begun by the work of a student completing his studies at an *Ecole d'Ingénieurs*[5] or a pertinent *DESS*[6] (for example Pernot, 1992 ; Andreau, 1993 ; Béguery, 1995) and the student generally concentrates on establishing the actual practices of the respective *AOC*. The work may subsequently be adopted by institutes or companies concerned with the product. For example, ENIL[7] de Mamirolles worked on the *appellations Mont d'Or* and ENIL de Poligny on the cheese *Morbier* during the procedure of *AOC* recognition.

2.3.4. The key-role of INAO

The inherent variability of *AOC* products is an essential characteristic. The official definition of specific descriptors, by the approval system for example, should not lead to a reduction of this variability even if it is often the source of problems. By means of its advisory role and as (non-acting) guarantor of *AOC* procedures, INAO is particularly well placed to assure that this does not occur.

Nevertheless, to fulfil this task, the representatives of INAO must possess the necessary competence in sensorial analysis. To ensure that this need is met, INAO set up in 1996 a group composed of a dozen of its representatives from different centres and already experienced in sensorial analyses. This commission, chaired by one of

the authors of this paper (J.T.), meets periodically for two days to discuss problems encountered by an existing appellation or of one in the process of recognition. The aim of these sessions is twofold. Firstly, to reveal to the participants by means of tasting, the unique character (or *typicité*) of a *AOC* product within a broader class of products (for example the unique character of *AOC Mont d'Or* compared to other soft washed-rind cow's cheeses). Secondly, to allow the participants to define a tasting methodology and, if necessary, to enrich the respective product vocabulary. Finally, the group has to communicate its experience to other representatives of INAO.

Training takes place on-site, to allow an appreciation of the regional culture and where possible to visit a site of production and/or manufacture. Technical and scientific factors relating to the unique character of the product are supplied by the relevant specialists and products particularly typical of their category or appellation are evaluated so as to appreciate the variability of *AOC* products.

Up to date, the group has been involved with the following products : mussels (the request for *AOC* recognition of *Moule de la baie du Mont St. Michel*), washed rind soft-cheeses (application of *AOC* Epoisses, Langres, *AOC Mont d'Or*, Munster), poultry (the *AOC* application for *Volaille de Bresse*), goat's cheeses (applications of *AOC Crottin de Chavignol, St. Maure, Valencay*), olives and olive oil (*AOC* applications for *Olives et Huile d'Olives de Nyons, des Baux de Provence*).

2.3.5. Training of participants in AOC production

A few years ago, one of the authors of this paper (F.S) received a visit from an *AOC* representative who asked him the following question "*we have the habit of meeting twice a year to grant the AOC mark to the products of our members. One of our members was regularly refused this mark. Can you tell us how often we should meet so that this occurs less often ?*". The idea behind this question was that the fear of indictment would lead the member to "improve his work". The obvious response was : "*Do not modify the frequency of your meetings, but try to ensure that the member is trained in better production techniques so that the problems are resolved*". It is clear that training is all the more necessary when the methods of manufacture are not subject to constraining norms.

CONCLUSION

The control of quality and the verification of product characteristics are in the case of *AOC* products the responsibility of the relevant professions, the task of the INAO being to ensure the reliability of the procedure (and obviously the guarantee of origin). An examination of actual practices indicates good involvement of professionals in quality control and the elimination of non-conforming products. Nevertheless, the descriptors used appear qualitatively and quantitatively inadequate to account for or to communicate the rich diversity of an appellation product.

The approach adopted by the group INAO should be underlined as it allows the sensorial characterisation of *AOC* products while respecting their diversity and environmental and cultural aspects of the appellation. This approach can lead to more suitable methodologies and help with the definition of adequate terms that allow for a more precise sensorial characterisation of *AOC* products. In this regard, the publication at regular intervals of the sensorial work of INAO is to be considered.

ACKNOWLEDGEMENTS

The authors would like to thank the various representatives of INAO who supplied them with data.

NOTES

(1) INAO : Institut National des Appellations d'Origine.
(2) AOC : Appellation d'Origine Contrôlée.
(3) OIV : Office International de la Vigne et du Vin.
(4) ANAOF : Association Nationale des Appellations d'Origine Fromagère (France).
(5) Graduate engineering school.
(6) Postgraduate diploma.
(7) ENIL : Ecole Nationale des Industries Laitières.

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