

HOW REPRESENTATIVE OF THE HUMAN SMOKING  
BEHAVIOUR WOULD THE NEW ALTERNATIVE  
SMOKING REGIMES BE?

A first attempt of assessment.

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CORESTA 2006

# CONTEXT

- ISO TC 126 : new working group WG9
  - To define a new smoking regime « more representative of human smoking behaviour than ISO standard »
- First Result of WG9 :
  - 3 alternative regimes, + Intense regime (Canada) to be considered (WHO)
- Final WG9 proposal :
  - Choice to be made (ISO TC 126) between WGB and Intense regime

# MACHINE SMOKING CONDITIONS

<b>CODE</b>	<b>ORIGINE</b>	<b>Puff volume (mL)</b>	<b>Puff interval (s)</b>	<b>Vent blocking (%)</b>
<b>INT</b>	CANADA	55	30	100
<b>ISO</b>	ISO	35	60	0
<b>WGA</b>	WG9	55	30	50
<b>WGB</b>	WG9	60	30	50
<b>WGC</b>	WG9	45	30	100

# OBJECTIVE of the study

- Using previously assessed human smokers yields
- Smoking the same cigarettes under the different machine smoking regimes
- To compare the human yields previously assessed to the different machine yields



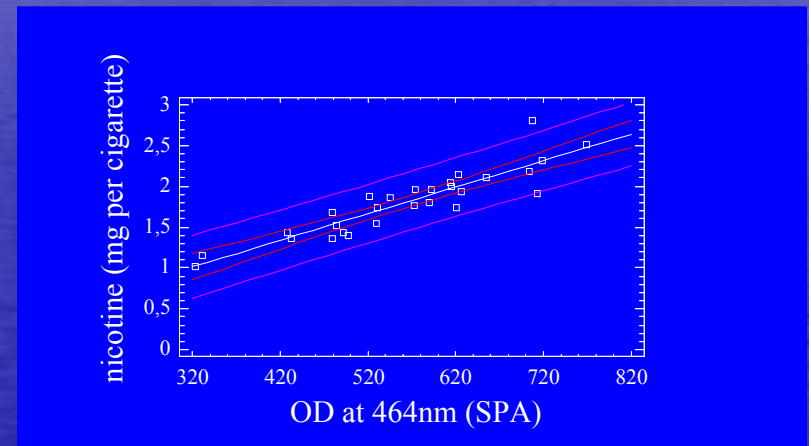
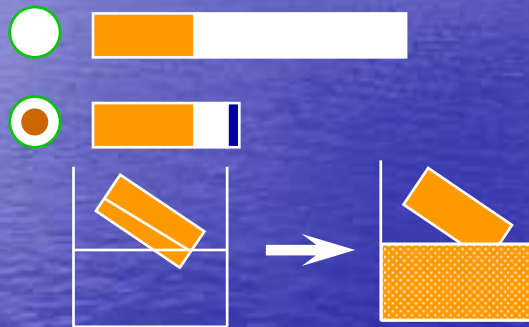
Puffing profile

YIELDS Measurements

LABORATORY  
CONDITIONS

DUPLICATION

CALIBRATION CURVES



NATURAL CONDITIONS

YIELDS Assessment

# CIGARETTES / SMOKERS CHARACTERISTICS

	FULL		LIGHT	
	Full 1	Full 2	Light 1	Light 2
<b>Tar</b> (mg/cig)	11.3	10.3	7.8	7.9
<b>Nicotine</b> (mg/cig)	0.92	0.80	0.72	0.66
<b>CO</b> (mg/cig)	9.8	10.4	8.7	8.9
<b>FV</b> (%)	12	21	33	34
<b>Filter format</b>	KS21	KS21	KS27	KS27
<b>Number of smokers</b>	61	52	133	186
<b>Number of butts</b>	305	490	2 332	3 564

➤ 4 commercial cigarettes (French market)



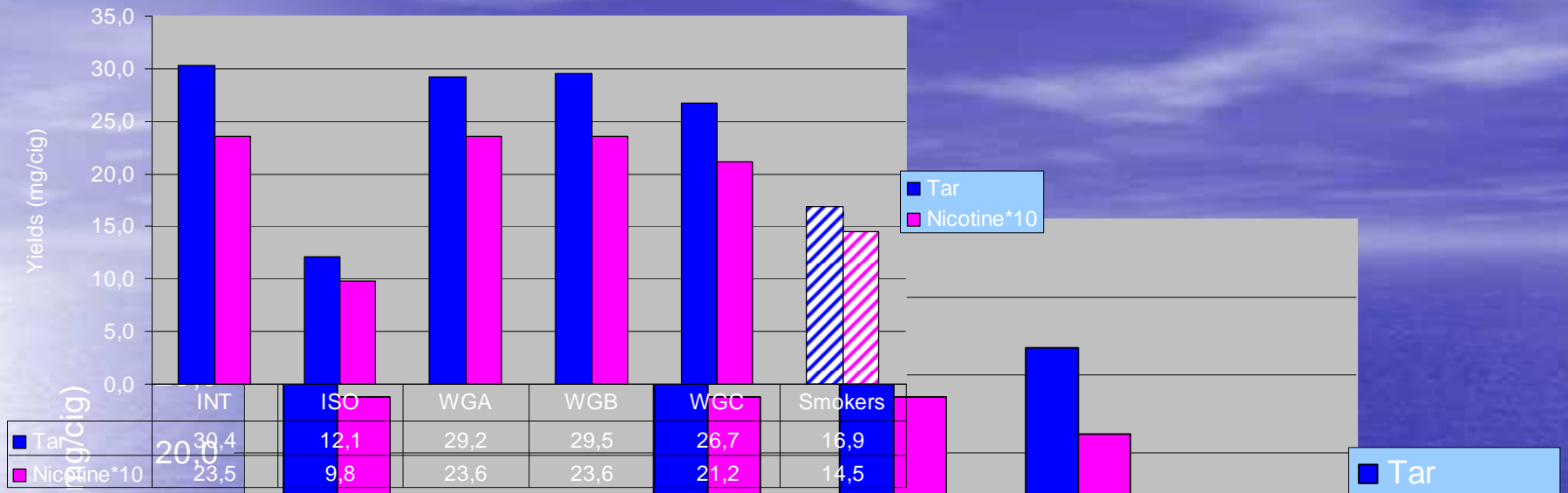
Total number of subjects = 432

Total number of butts = 6 691

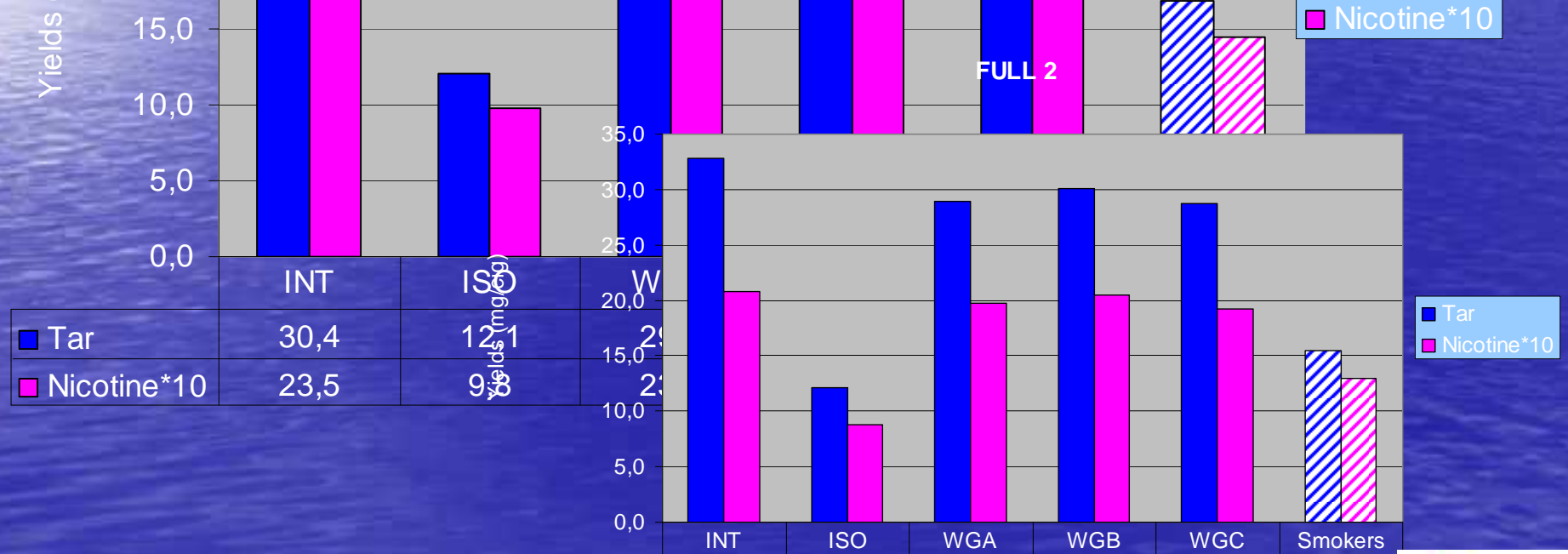
# RESULTS

- Machine yields vs average Smokers yields
- Detailed Smokers yields vs Machine yields

# FULL 1



# FULL 2

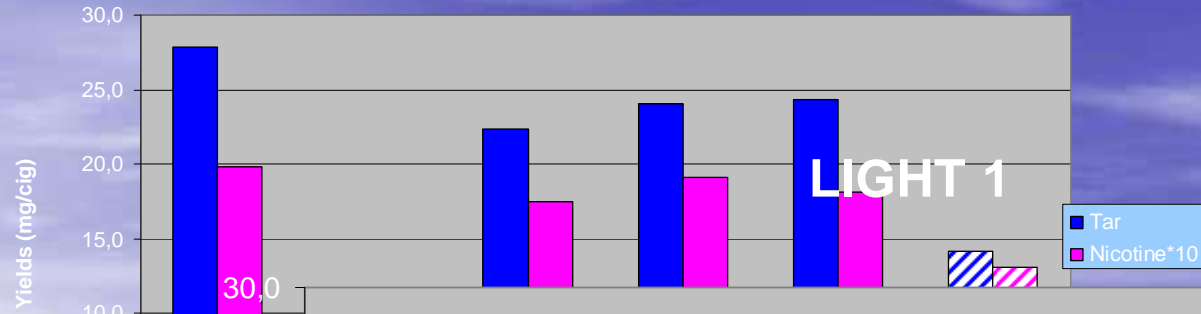


	INT	ISO	WGA	WGB	WGC	Smokers
Tar	32,8	12,1	29,0	30,1	28,7	15,5
Nicotine*10	20,8	8,8	19,7	20,4	19,3	13,0





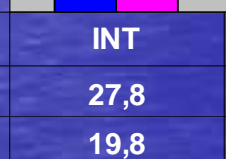
# LIGHT 1



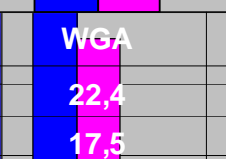
	INT
Tar	27,8
Nicotine*10	19,8



	INT	ISO
Tar	27,8	7,8
Nicotine*10	19,8	7,8



	WGA	WGB	WGC
Tar	22,4	24,1	24,3
Nicotine*10	17,5	19,1	18,1



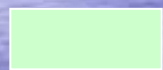
	WGC	Smokers
Tar	14,1	14,5
Nicotine*10	13,1	11,6

	INT	ISO	WGA	WGB	WGC	Smokers
Tar	28,0	9,5	24,2	24,8	27,0	14,5
Nicotine*10	18,1	7,3	17,1	17,3	16,6	11,6



# RESULTS

- *Machine yields vs average Smokers yields*
- Detailed Smokers yields vs Machine yields



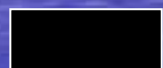
Smokers yields below ISO



Smokers yields between ISO and the lowest alternative regimes' yield



Smokers yields between the lowest and highest alternative regimes' yield



Smokers yields higher than the highest alternative regimes' yield

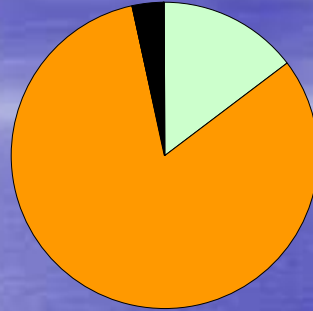
# FULL

## Tar

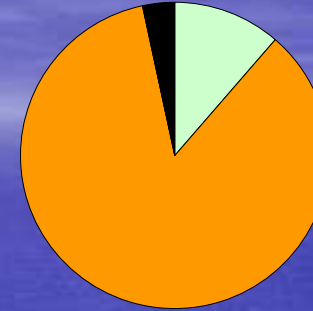
## Nicotine

### FULL 1

n=61



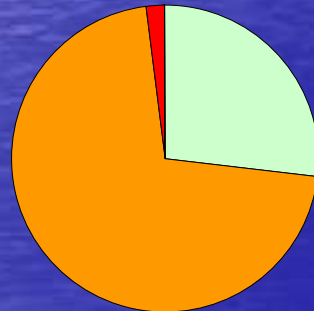
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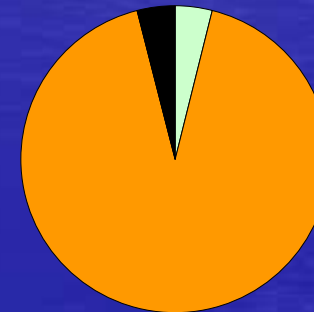
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### FULL 2

n=52



Legend: ■ < iso ■ iso = x < lowest alt. ■ lowest alt. = x = highest alt. ■ highest alt. < x



Legend: ■ < iso ■ iso = x < lowest alt. ■ lowest alt. = x = highest alt. ■ highest alt. < x

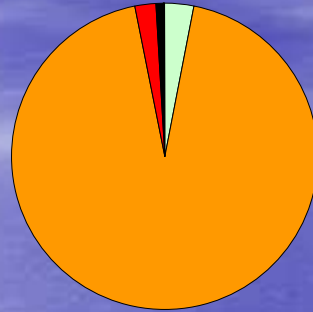
# LIGHT

## Tar

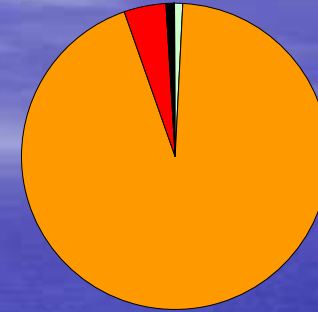
## Nicotine

LIGHT 1

n=133



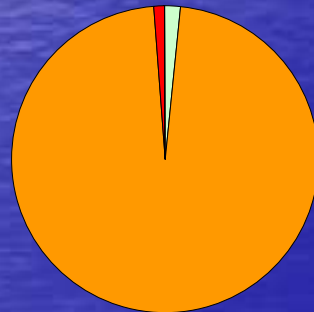
■ < iso ■ iso = x < lowest alt. ■ lowest alt. = x = highest alt. ■ highest alt. < x



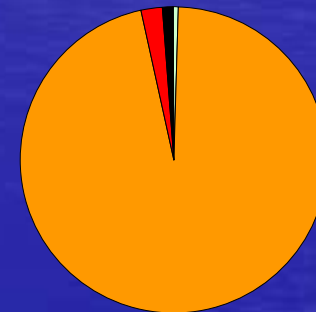
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LIGHT 2

n=186



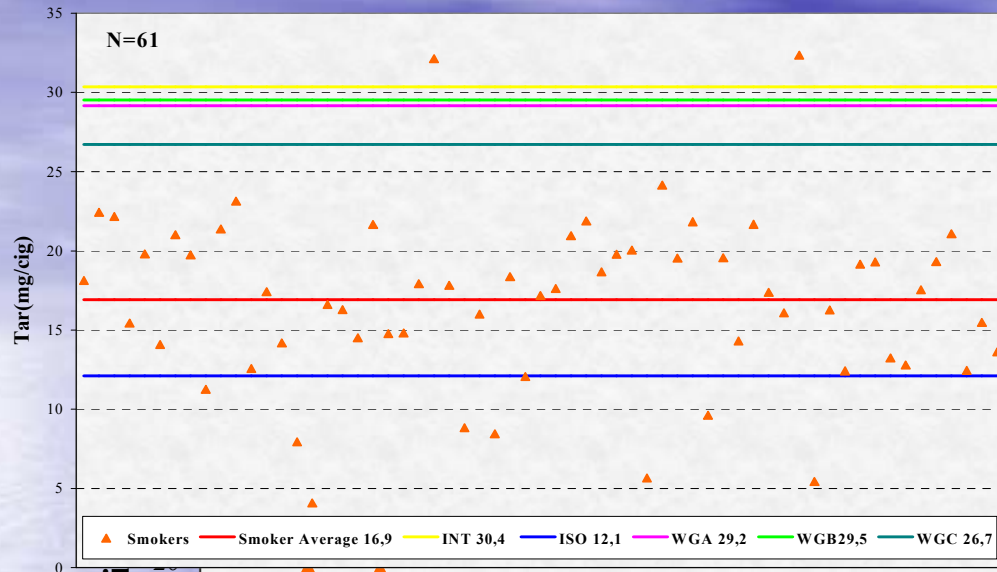
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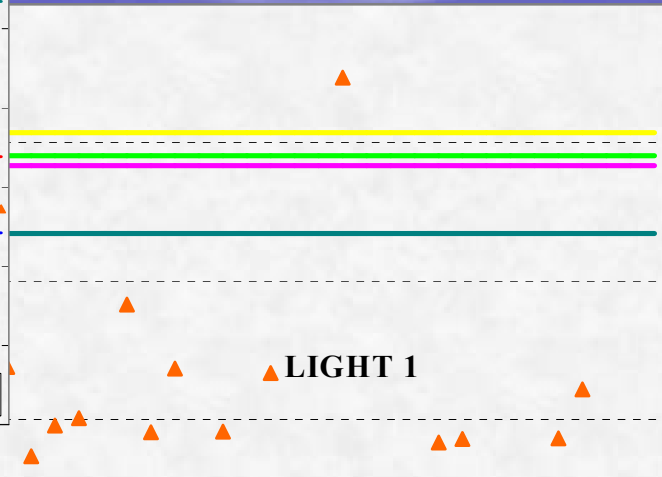
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FULL 1

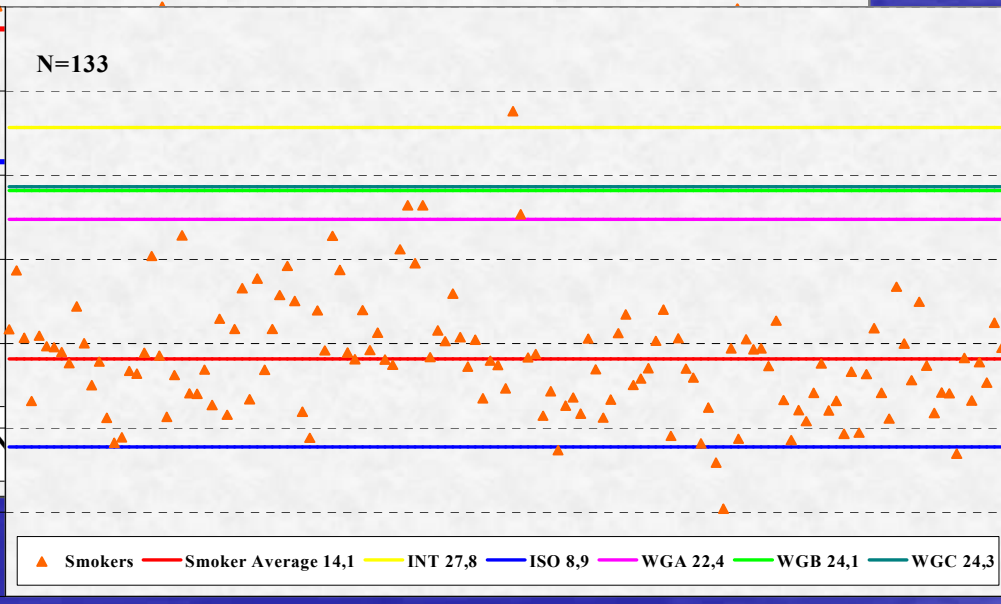
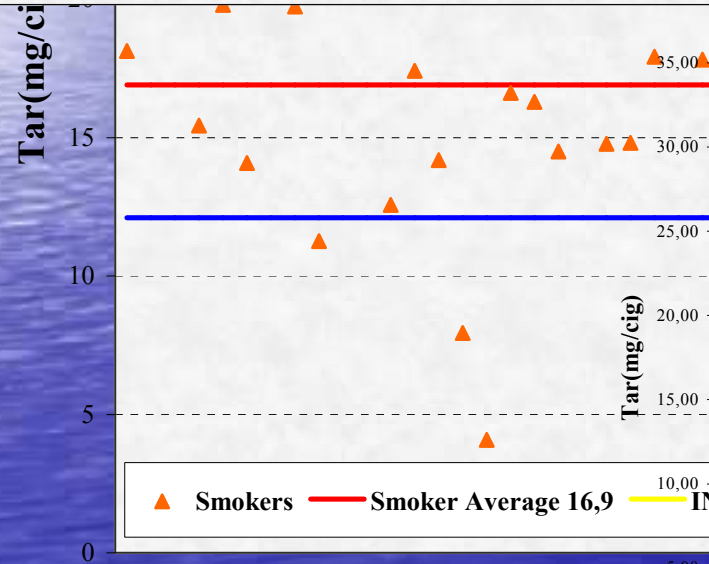
# TAR



LL 1



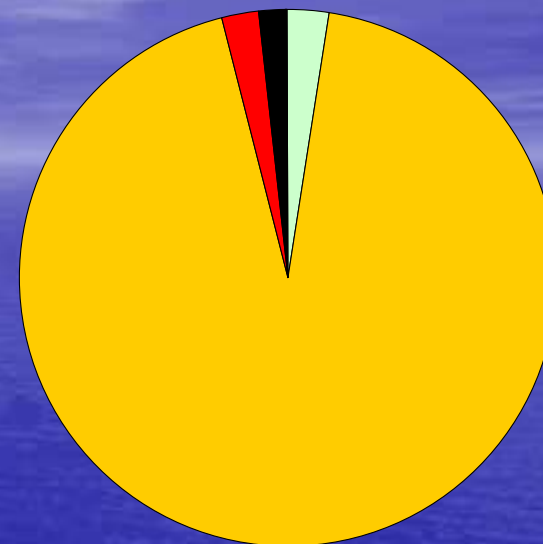
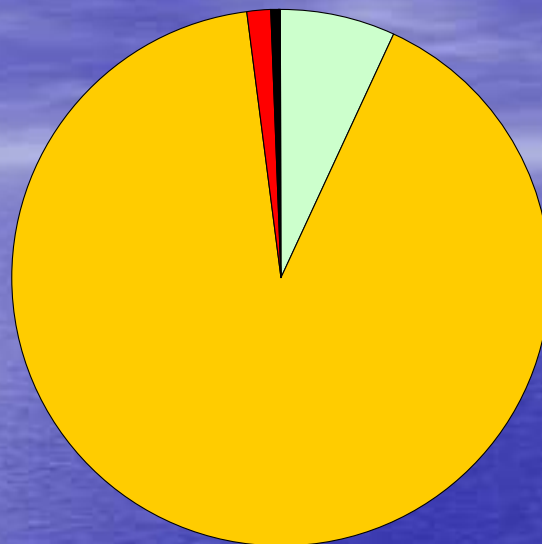
LIGHT 1



# Tar

# Nicotine

432 smokers  
6691 butts



■ < iso 
 ■ iso = x < lowest alt. 
 ■ lowest alt. = x = highest alt. 
 ■ highest alt. < x

■ < iso 
 ■ iso = x < lowest alt. 
 ■ lowest alt. = x = highest alt. 
 ■ highest alt. < x

	Tar	Nicotine
X < ISO	7% (n=30)	3% (n=11)
Lowest > X ≥ ISO	91% (n=393)	93% (n=404)
Highest > X ≥ Lowest	1% (n=6)	2% (n=10)
X > Highest	1% (n=3)	2% (n=7)

# CONCLUSIONS

- ISO < average smoker < alternative regimes yields
- > 95% of the smokers produce less tar and nicotine than the lowest alternative smoking regime
- None of them could pretend to be representative of the human smoking behaviour
- For low ventilated cigarettes, they could rather represent the maximum yields a smoker could produce from the cigarette