

PON and NNK changes in cured burley tobacco with storage

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Objective

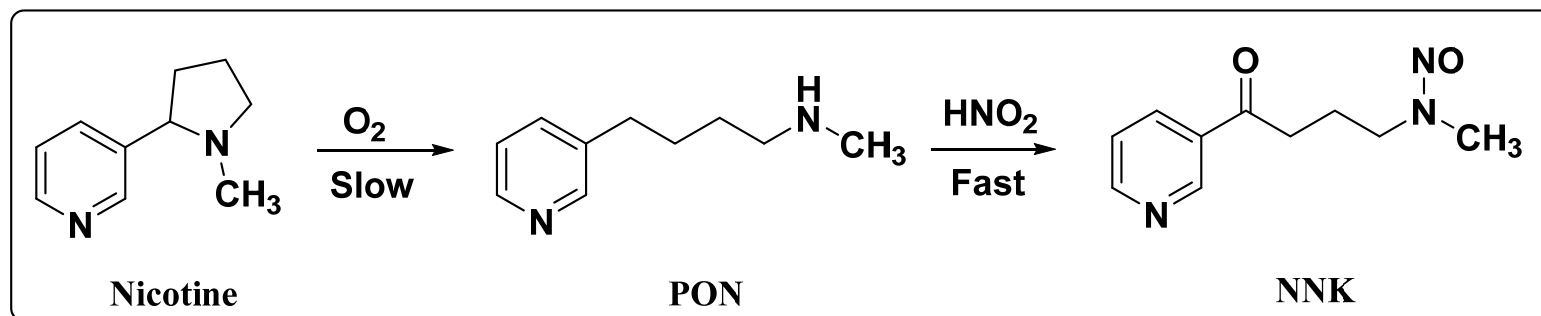
To determine the PON and NNK changes in 8%, 12%, 19%, 29% moisture content burley tobacco at 30°C, 60°C during 1 to 15 days for understanding the mechanisms of NNK formation.

Introduction: PON and NNK

PON: Pseudooxynicotine

an oxidation product of nicotine and is considered the precursor of NNK.

NNK: 4-(N-methyl-N-nitrosamino)-1-(3-pyridyl)-1-butanone, a potent tobacco-specific nitrosamine formed from the nitrosation of nicotine is considered to be the most potent carcinogen of the TSNAs.



Important TSNAs: NNN, NAT, NAB, NNK

Material, Chemicals and instrument

- Air cured ground burley tobacco
- NaOH, K₂CO₃, KCl
- PON, NNK,
PON-d₃, NNK-d₄

Salt	Moisture content in burley tobacco %
Initial	12
NaOH	8
K ₂ CO ₃	19
KCl	29

Instruments: UPLC-MS/MS equipped with a Column 2.1 x 50 mm C18 with 1.7 μm particles.

Preparation of different moisture content burley tobacco with nitrate or nitrite

- *Ground burley tobacco powder was weight and put in a sealed container with saturated salt solution about one week.*
- *Testing the moisture content by moisture analyzer.*
- *1g conditioned ground burley tobacco was put in a closed system with 1.5 ml plastic tube include 500mg Nitrate or Nitrite powder.*
- *The closed bottles were put in the 30°C and 60°C oven respectively.*

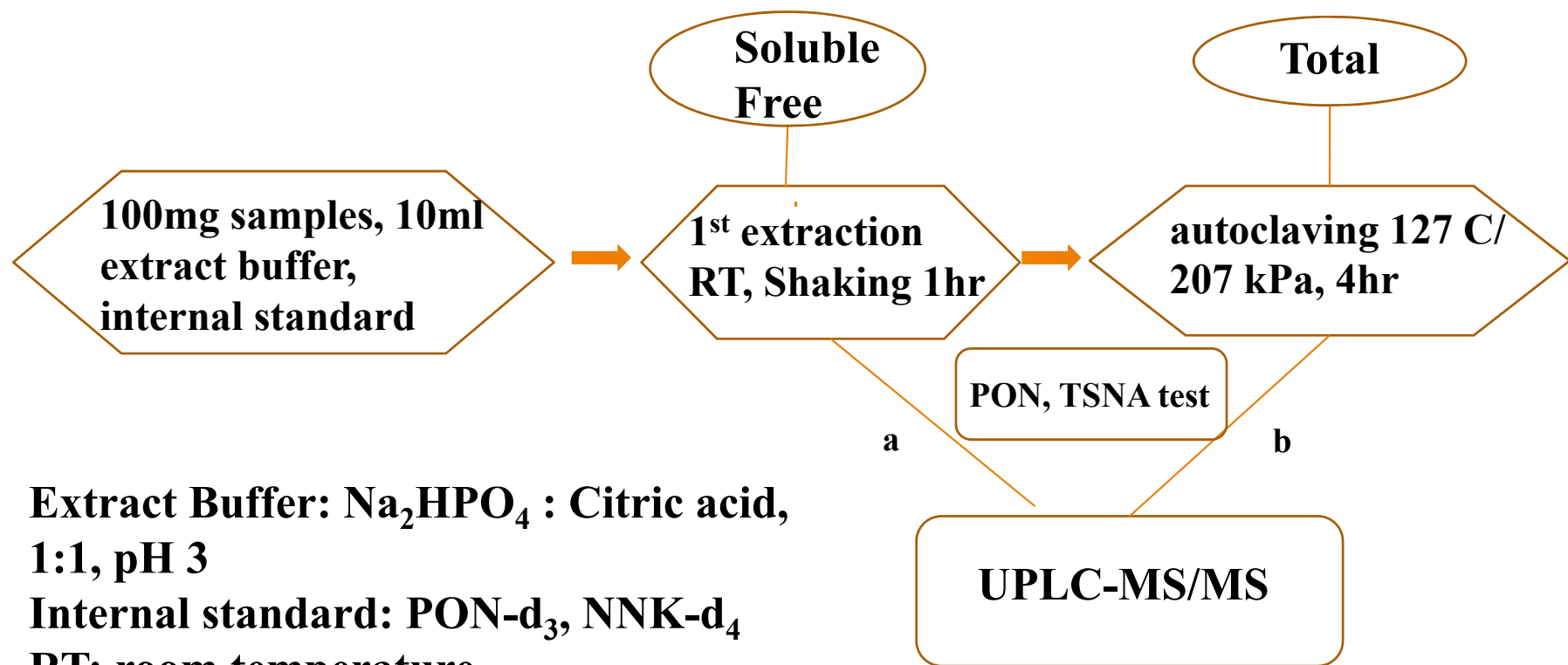


Control

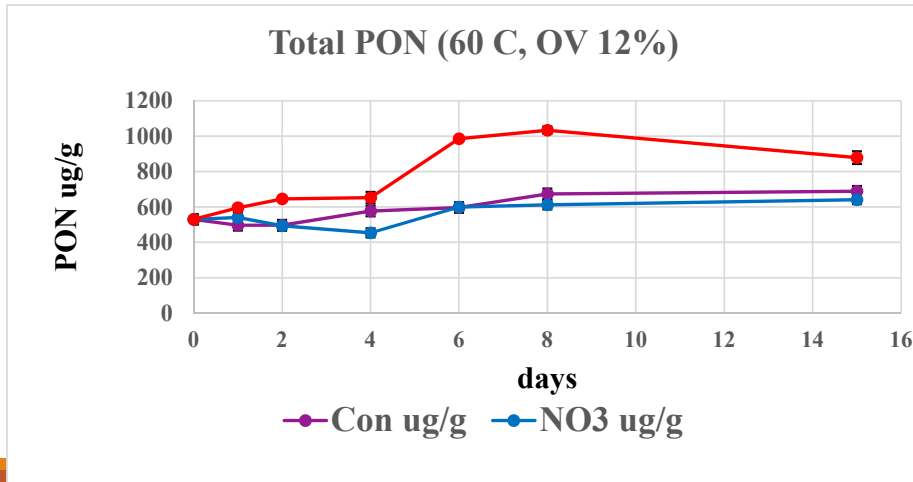
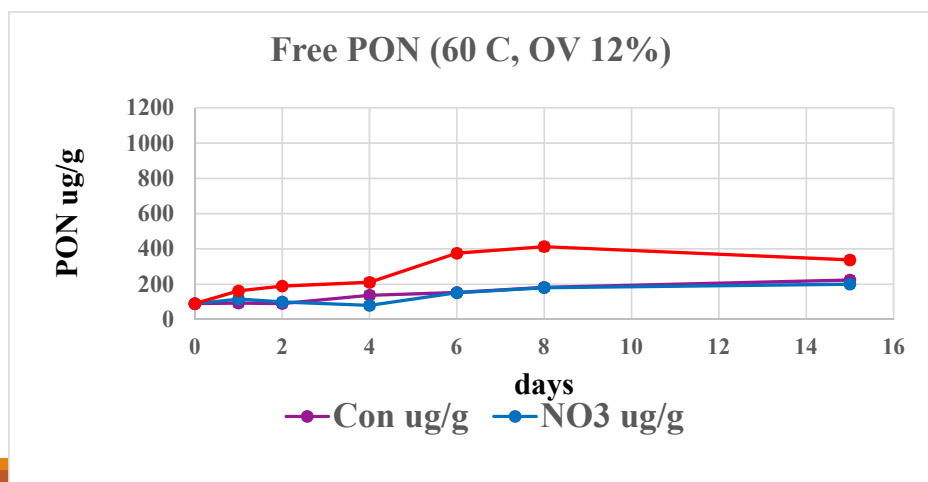
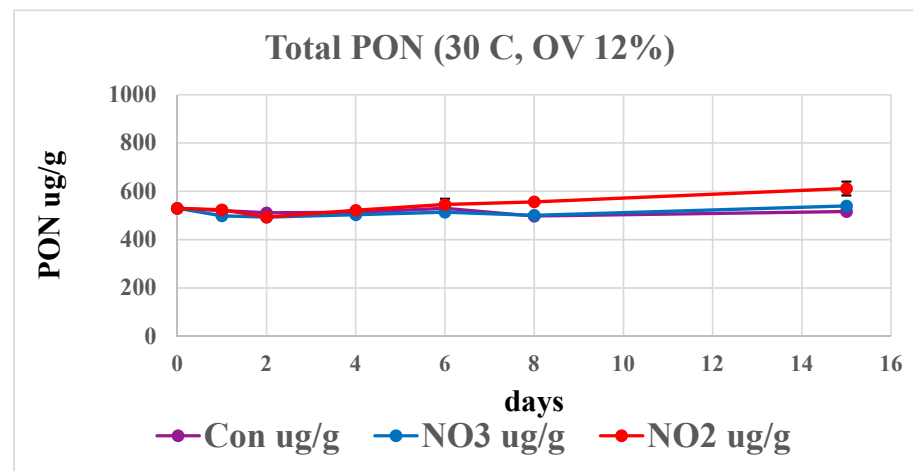
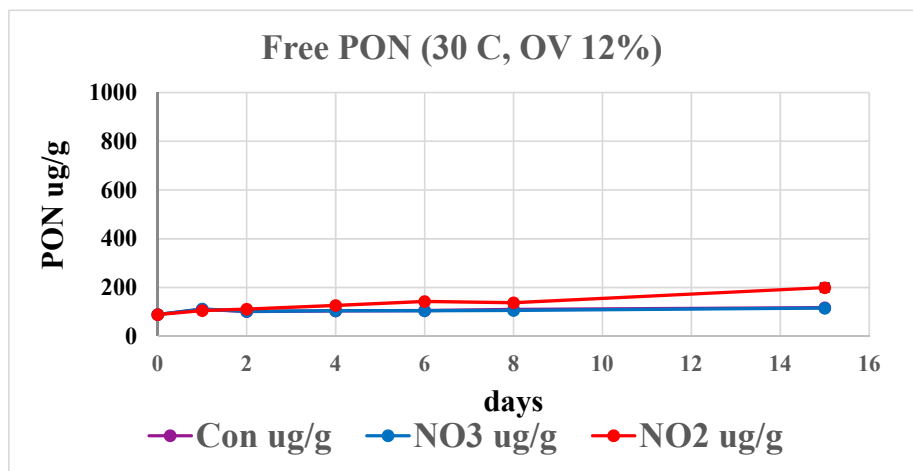
Nitrate

Nitrite

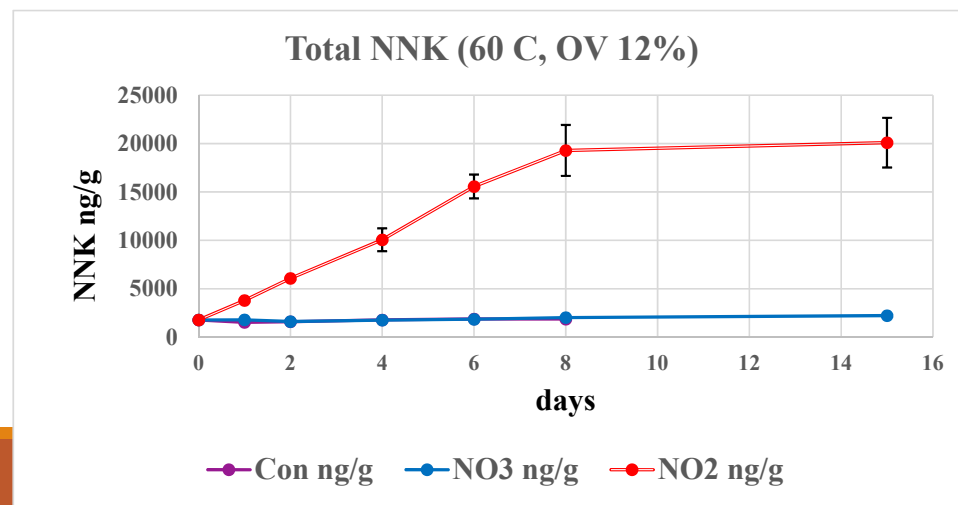
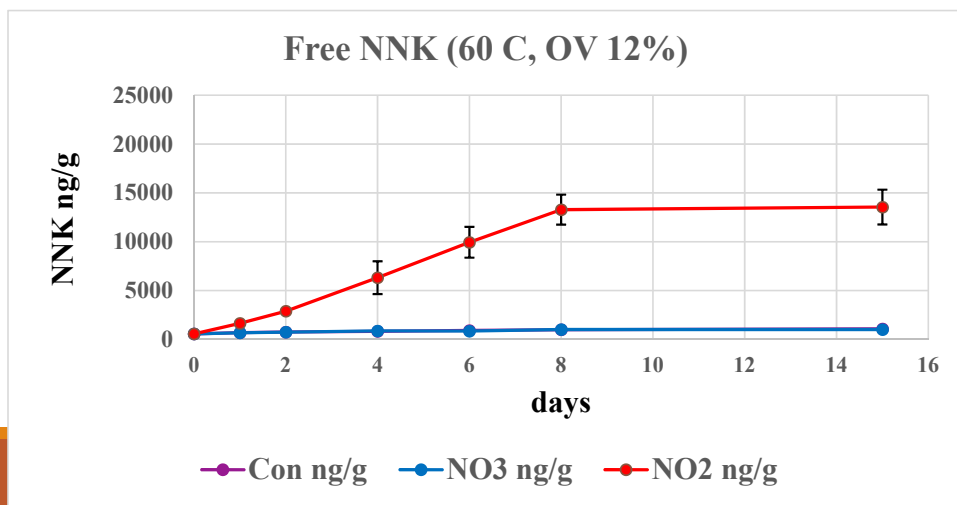
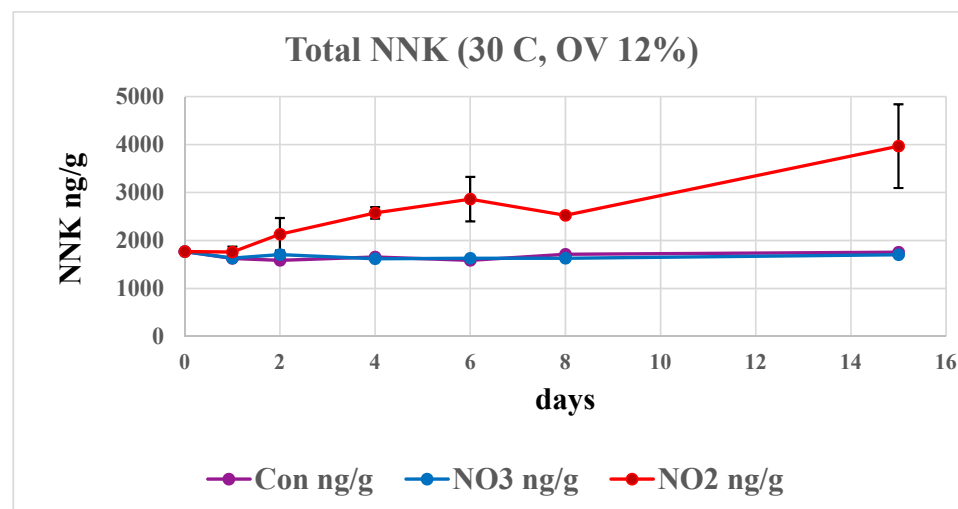
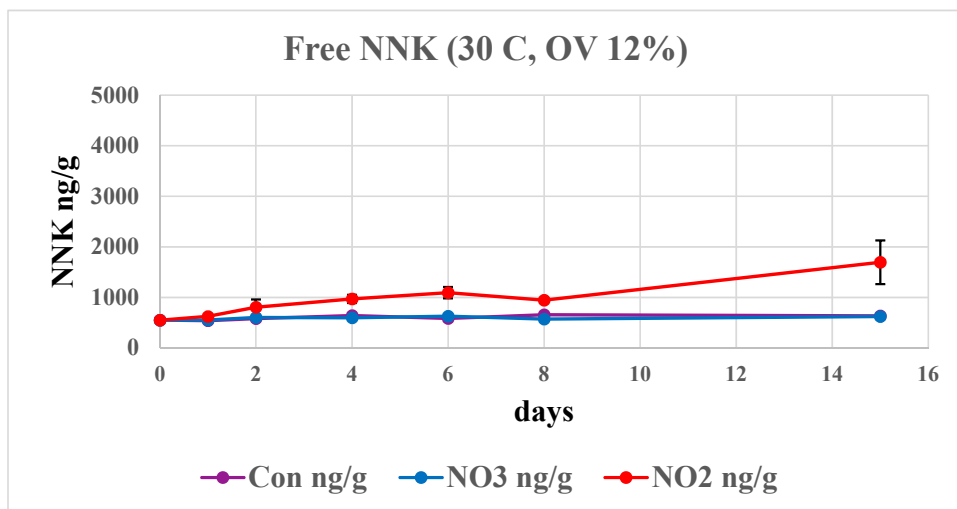
Extraction and analysis of ground burley tobacco for PON and TSNA



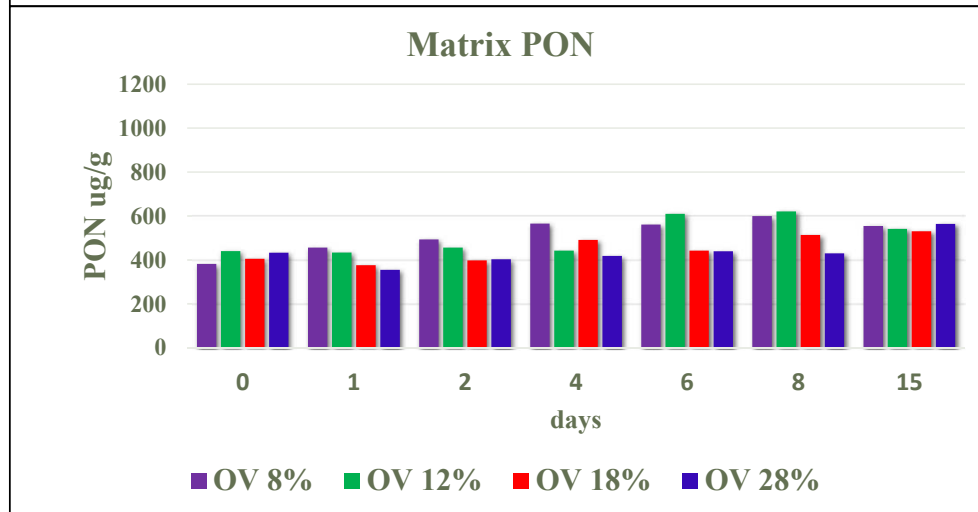
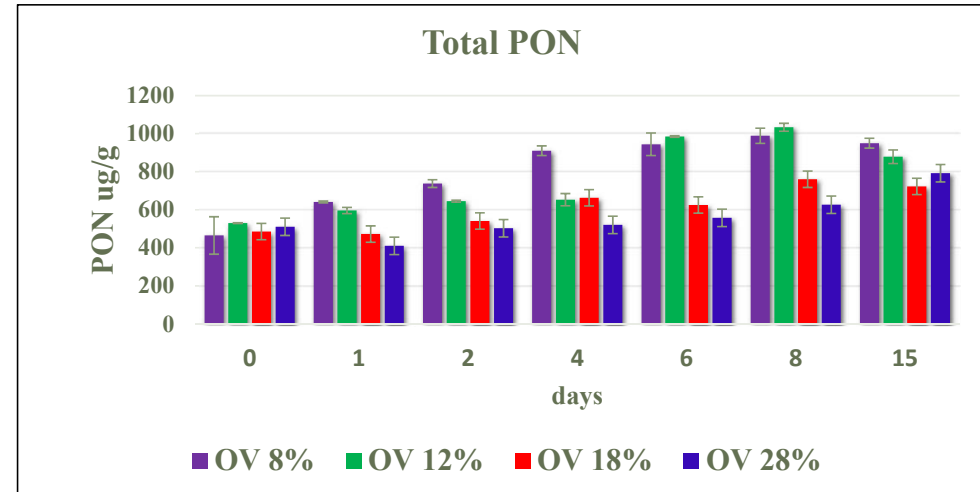
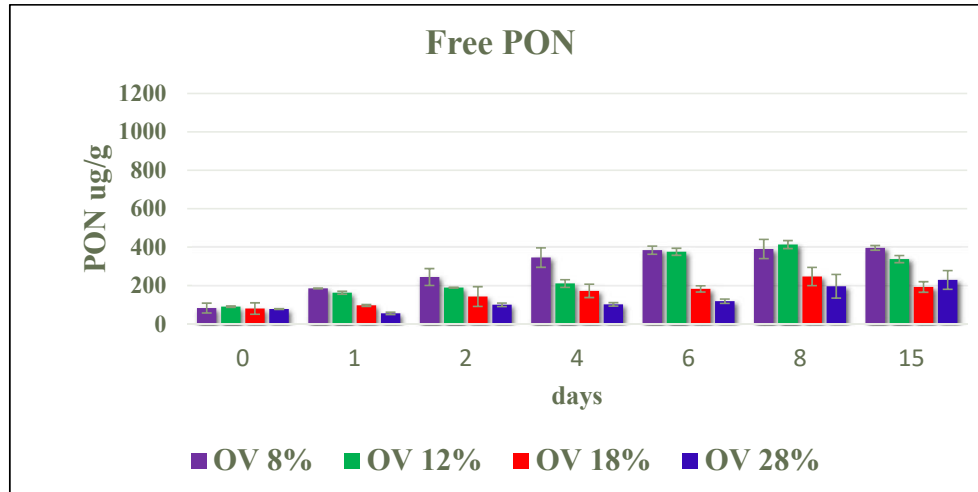
Results: Changes of PON at 30°C, 60°C, OV 12%



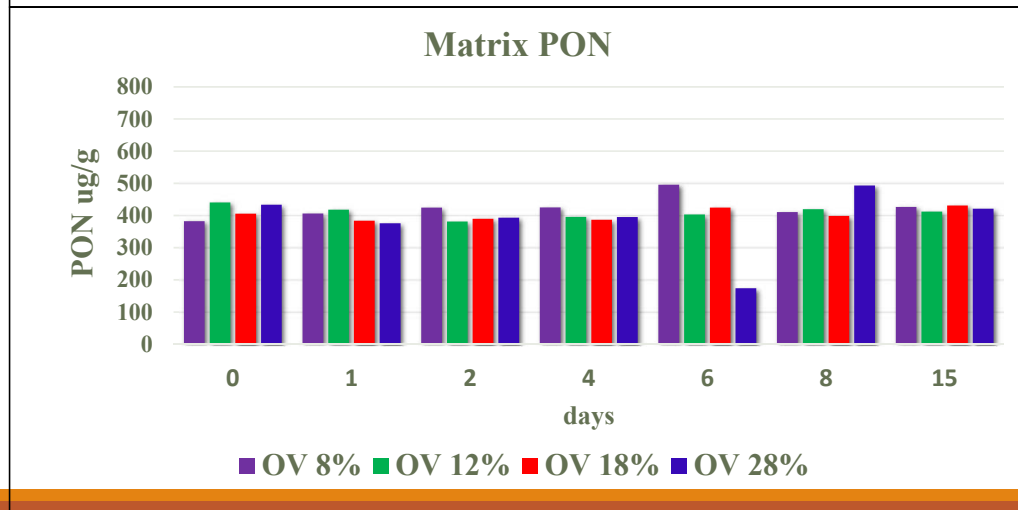
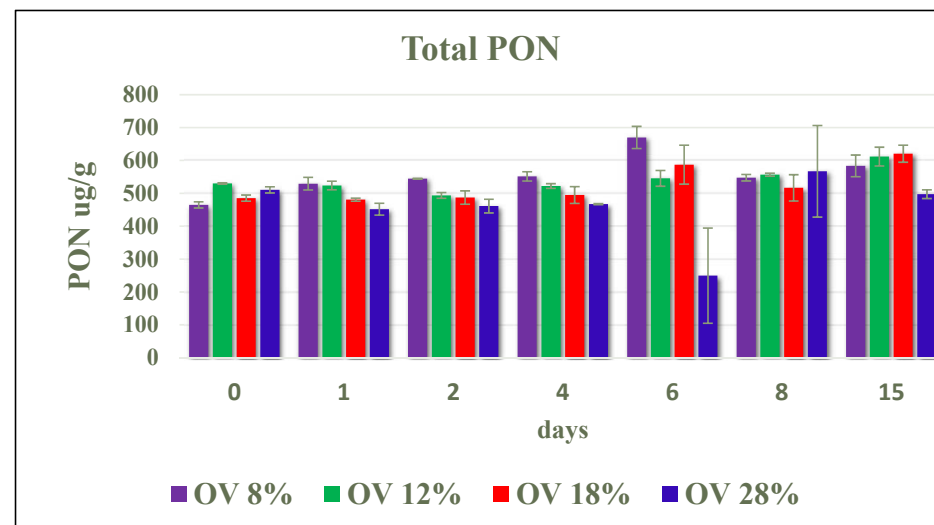
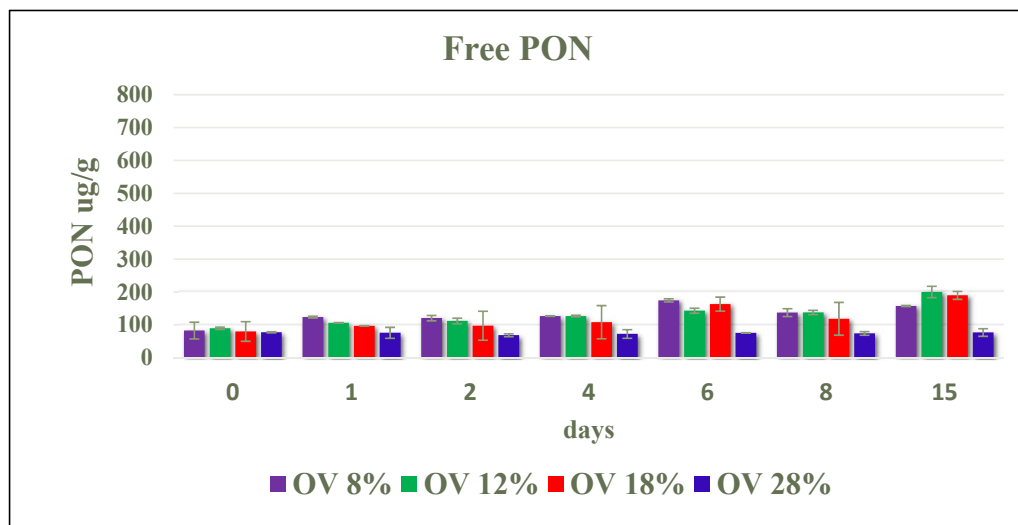
Changes of NNK at 30°C, 60°C, OV 12%



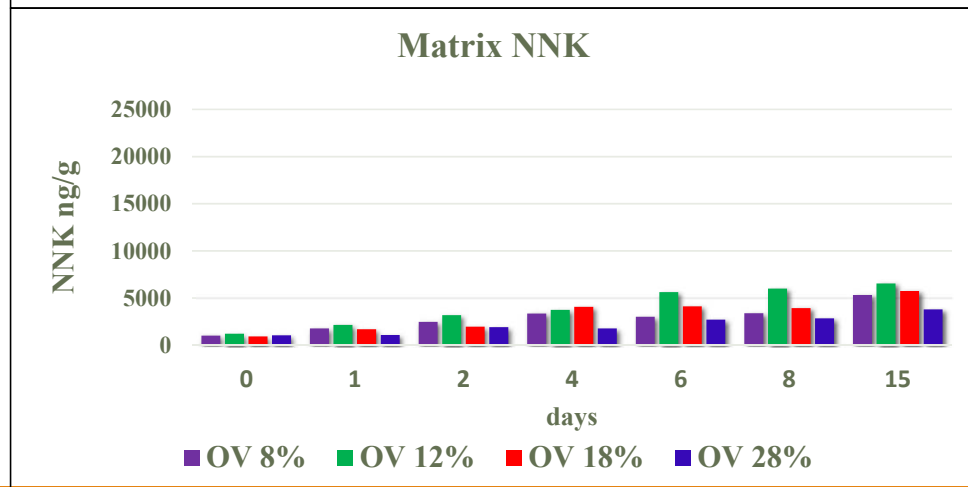
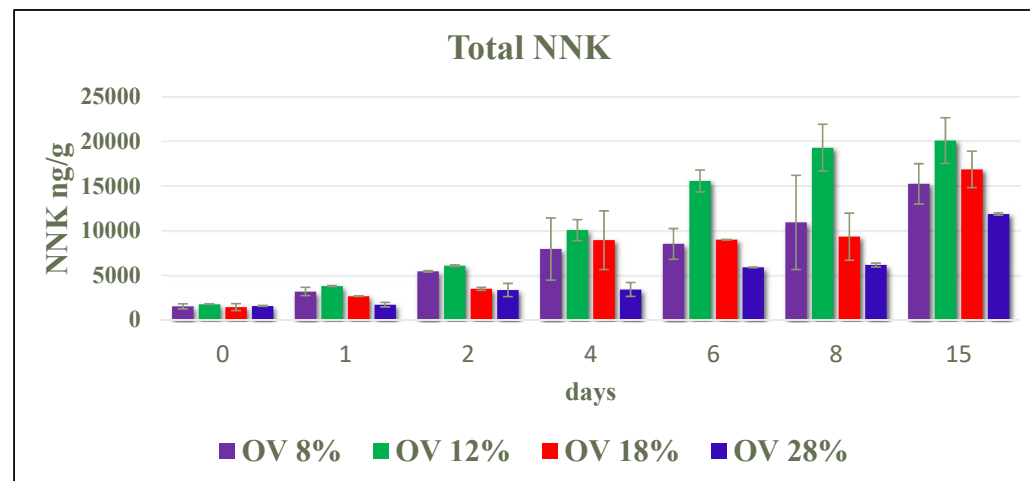
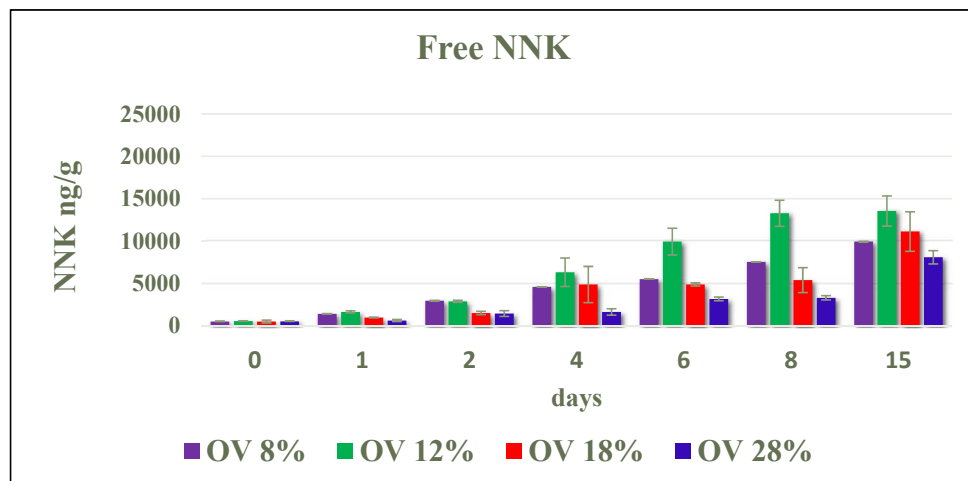
PON Changes at 60°C with nitrite



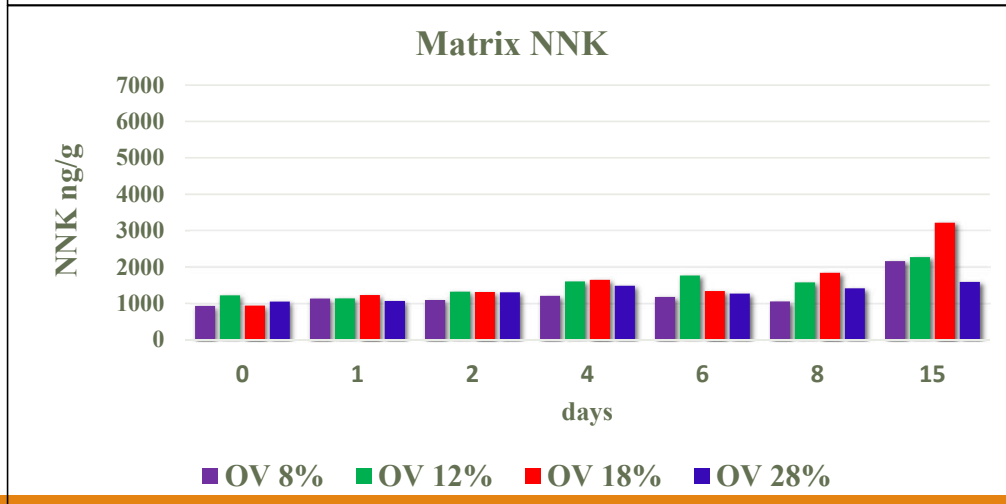
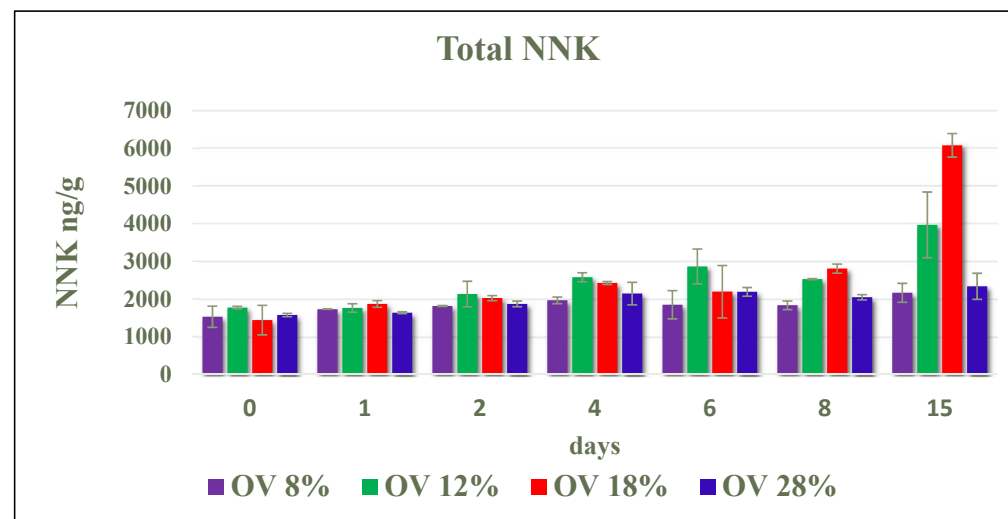
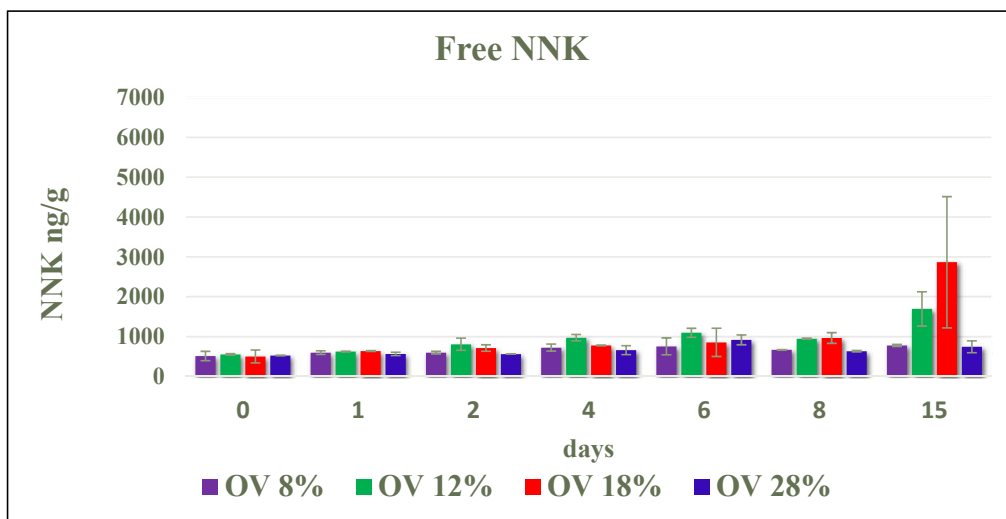
PON Changes at 30°C with nitrite



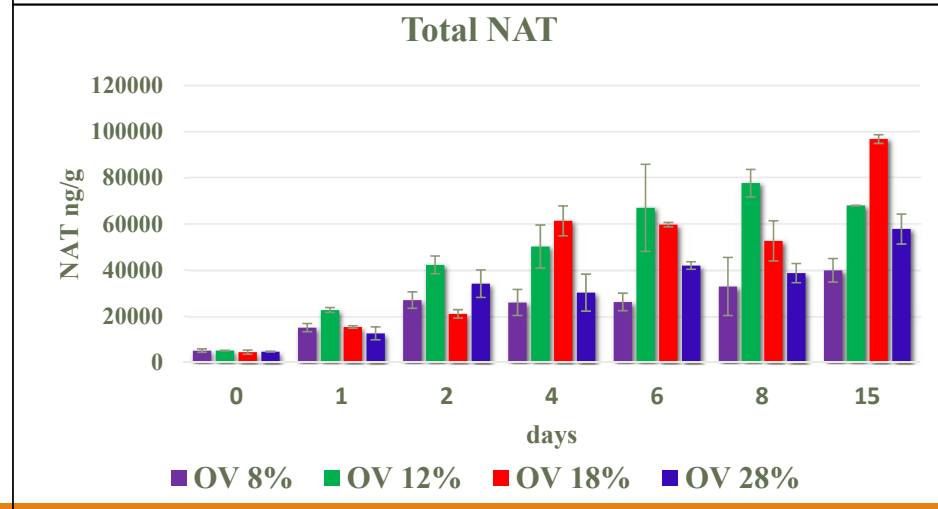
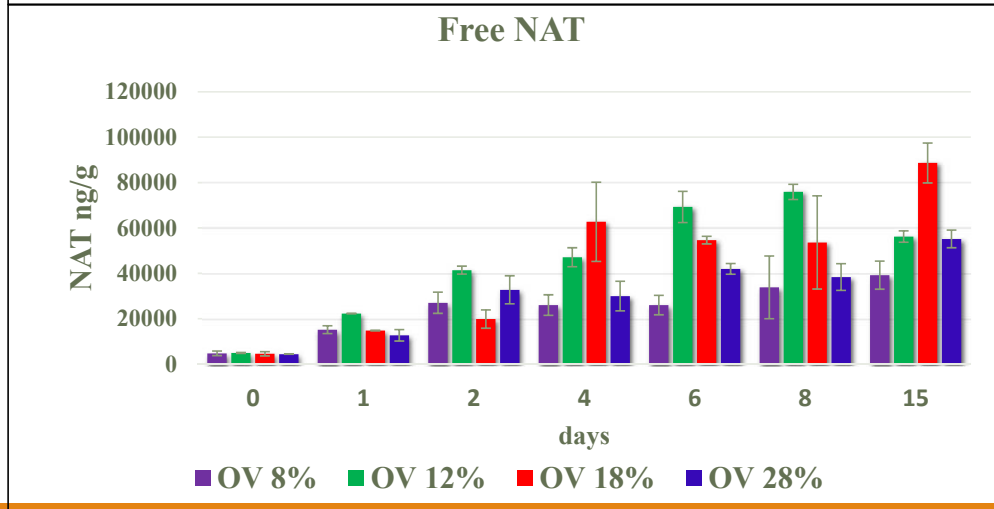
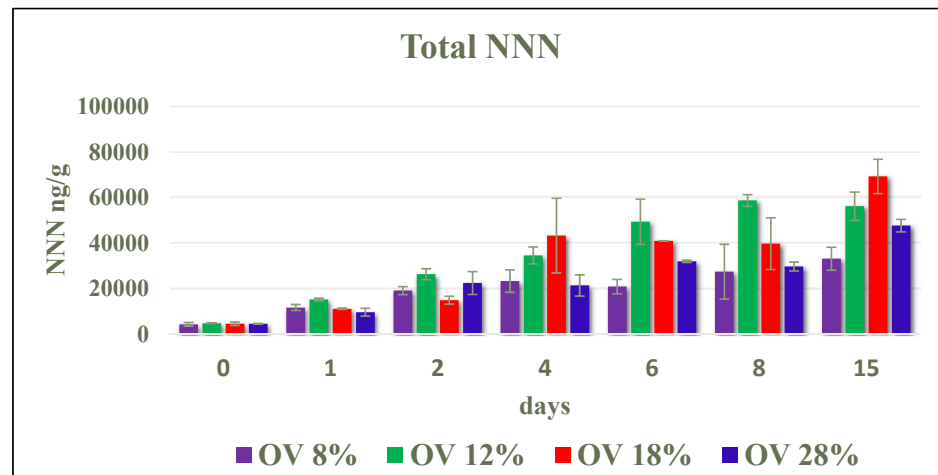
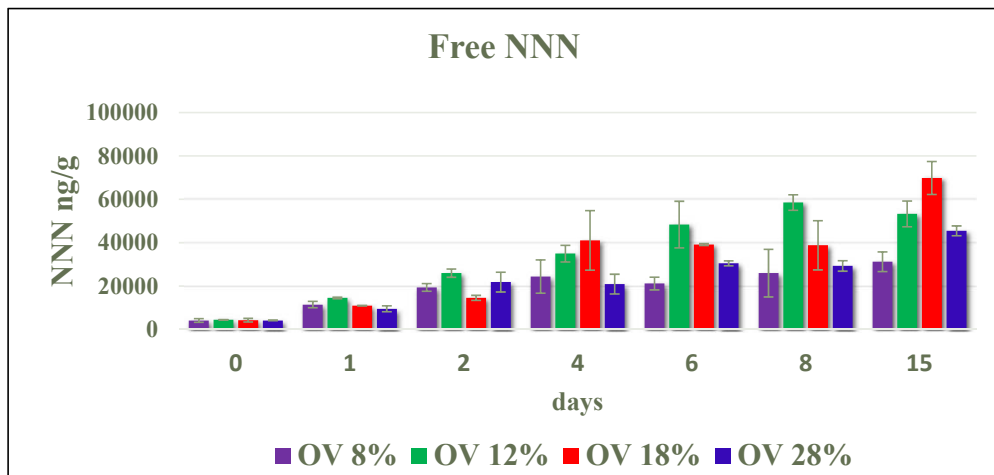
NNK Changes at 60°C with nitrite



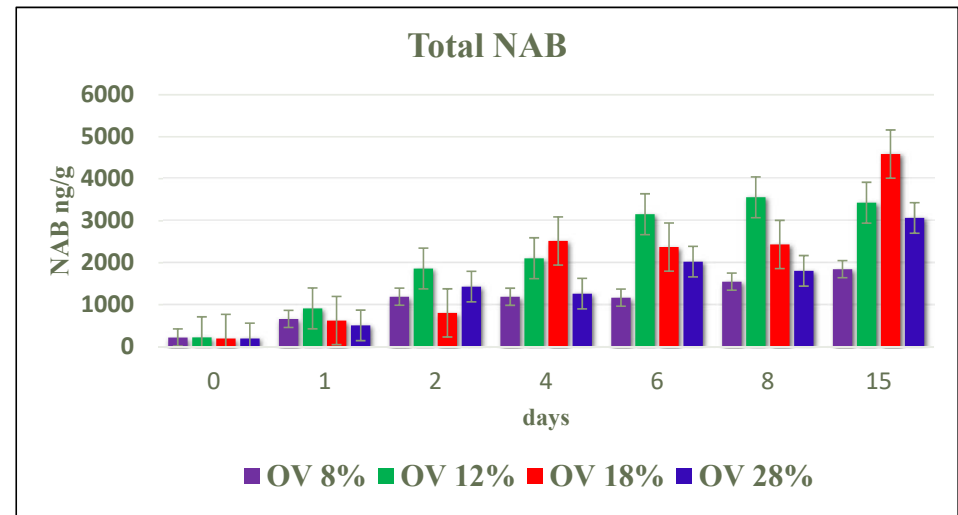
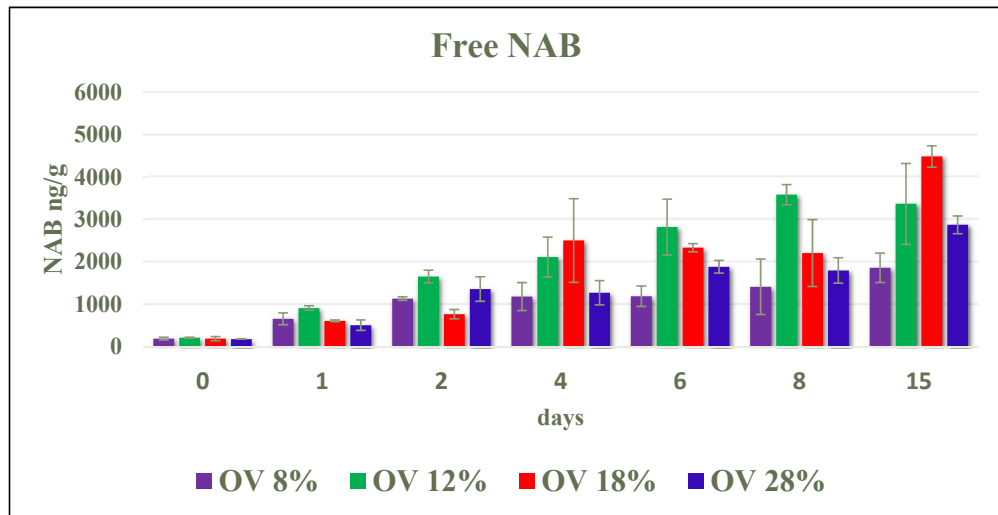
NNK Changes at 30°C with nitrite



Changes of NNN, NAT, NAB at 60°C with nitrite



Change of NNN, NAT, NAB at 60°C with nitrite



Conclusions

- **Small change in free PON and no change in Matrix PON at 30°C and 60°C during 15 days.**
- **PON and NNK are changed more at 60°C than at 30°C for 15 days.**
- **Addition of NO₂ increased PON and TSNA formation at 60°C in conditioned ground burley tobacco.**
- **NNK increased great with moisture content rang 12-18% with NO₂ addition at 60°C.**
- **Nitrite was more effective in promoting PON and TSNA formation in the ground burley tobacco.**

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- **Altria Client Services**
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