

2.0



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SMART BUYER 2.0

Quality without scams: how the market works, how to read a certificate of analysis line by line, the vendor scorecard and what to do when the box arrives.

COA line by line

Vendor scorecard

Red flags

Educational and informational reference for adults. Not medical advice, and not a recommendation to use any substance. Many compounds described are not approved for human use and several are prohibited in sport. Decisions about any compound belong to you and a licensed clinician.

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Smart Buyer 2.0: assessing quality documentation

Quality assessment starts with evidence connecting a specific product, a specific lot, and a specific set of measurements. Packaging, testimonials, price, and a laboratory logo cannot establish that connection. This guide explains how to assess documentation, recognize missing tests, and identify uncertainty that available records cannot resolve.

A certificate supports only the sample and tests it documents. Even a genuine, comprehensive COA does not establish that a research product is suitable for human use.

The evidence here concerns analytical quality and supply-chain documentation. The product's A to D scale describes therapeutic evidence and does not apply to this documentation framework. Laboratory findings do not establish clinical benefit. The scorecard is an editorial screening tool, not a validated predictor of safety or treatment outcomes.

How the grey market works

A supply chain can include a peptide manufacturer, a bulk distributor, a filling or packaging operation, and a storefront. Some businesses perform several functions; others handle only labels and sales. Manufacturing, testing, filling, and shipping may occur at different sites. Each handoff can introduce substitution, contamination, storage errors, or lost traceability.

Research materials can have legitimate laboratory purposes. Problems arise when research-chemical documentation is presented as assurance of a finished medicine. A research-use label provides no evidence of pharmaceutical manufacturing controls, clinical suitability, or regulatory authorization. Legal status depends on the substance, intended use, and jurisdiction.

Synthesis can produce incomplete or altered sequences, purification can leave impurities, and subsequent handling can introduce further changes. Investigators studying falsified polypeptide drugs found variable quantities, peptide impurities, and elemental contamination. These findings demonstrate possible failure modes, not the prevalence of defects across every seller. Janvier, 2018, Talanta, PMID 30029448.

An online semaglutide test-purchase study received only three of six orders. Received samples showed discrepancies between advertised and measured purity, with measured active content exceeding the labeled amount. One sample had elevated endotoxin despite no detected viable microorganisms. The small, selected sample limits generalization and cannot establish market-wide defect rates. Ashraf, 2024, JAMA network open, PMID 39093567. [Study report](<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2821882>).

What a Certificate of Analysis actually is

A Certificate of Analysis, or COA, summarizes testing against stated specifications. It should identify the sample, methods, results, acceptance limits, dates, and authorizing laboratory or quality unit. A specification sheet states desired properties; a COA reports results for an identified sample. A chromatogram alone is neither a complete COA nor proof of traceability.

Read the COA line by line

1. Product identity. Check the exact chemical name, sequence when available, molecular form, and relevant modifications. Similar abbreviations can conceal different compounds. Salt forms, terminal modifications, and

conjugated groups should agree across the specification, label, and report. A familiar product nickname is insufficient identification.

2. Batch and lot. Match the report to the container and shipment records. A bulk manufacturing batch may differ from a finished filling lot, but a documented link must connect them. Testing of bulk powder before filling does not automatically establish the amount or microbial condition of each finished container.

3. Dates and sample description. Read the manufacturing date when supplied, sample receipt date, testing date, report issue date, and any expiry or retest date. Determine whether the laboratory received bulk material or finished units. An old report may be authentic yet irrelevant to current inventory or subsequent storage. A retest date is not automatically an expiry date.

4. HPLC purity. High-performance liquid chromatography separates detectable components under a defined method. A reported area percentage usually compares the target peak with the integrated peaks detected under those conditions. It does not automatically represent the fraction of the container's total mass attributable to the intended peptide.

Look for the method identifier, detector conditions, chromatogram, integration boundaries, numerical result, and acceptance limit. Some impurities can overlap the main peak or respond differently to detection. Ordinary peptide HPLC purity testing does not comprehensively measure water, salts, residual solvents, or microbial contaminants. Complementary methods address these gaps. McCarthy, 2023, Pharmaceutical research, PMID 36949371.

5. Mass spectrometry identity. Compare the expected molecular mass with the observed result and stated tolerance. The report should identify the method and explain charge-state or mass assignments sufficiently for technical interpretation. A matching mass supports identity but cannot resolve every sequence variant, stereochemical difference, or molecule with the same mass. McCarthy, 2023, Pharmaceutical research, PMID 36949371.

Additional sequence-sensitive or complementary testing may be necessary when basic mass measurement cannot distinguish relevant molecular features. Ask what the method establishes and what remains unresolved. An identity spectrum does not establish the amount per container unless an appropriate quantitative assay was also performed.

6. Net peptide content versus gross weight. Gross dry material can include peptide, counterions, residual water, and formulation ingredients. Net peptide content requires a defined measurement basis. Determine whether the label describes total solids, peptide salt, or peptide equivalent. Establish whether the reported quantity applies to bulk powder or finished units.

Illustrative material quantities, not administration doses: 10 mg total solids with an independently established target-peptide mass fraction of 80% contains 8 mg target peptide. HPLC area purity cannot substitute for that mass fraction. Quantitative peptide characterization requires suitable methods and reference standards. McCarthy, 2023, Pharmaceutical research, PMID 36949371; Nicolás Carcelén, 2024, Analytical and bioanalytical chemistry, PMID 38363304.

Read the assay method, calibration basis, units, measurement uncertainty when available, and sampling plan. A pooled measurement can conceal differences between individual units. Ask whether unit-to-unit content uniformity was assessed. Content above the label also requires assessment against the applicable specification; excess content is not a quality advantage.

7. Endotoxin. This test addresses bacterial endotoxins, not peptide identity or all possible pyrogens. Look for the method, numerical result, units, reporting limit, sample preparation, and acceptance criterion. EU means endotoxin units; EU/mL and EU/mg express different measurement bases and are not interchangeable. A result below a detection limit does not establish absolute zero.

The acceptance criterion must fit the intended pharmaceutical context, including the relevant route and exposure. No universal acceptable endotoxin number applies to every peptide product. Method suitability matters because the sample can interfere with detection. A pass statement without units, limits, and testing context is incomplete. [FDA, Pyrogen and Endotoxins Testing: Questions and Answers]

(<https://www.fda.gov/media/83477/download>)

8. Sterility. Determine whether a recognized sterility method was performed on representative finished units, with documented method suitability and sampling. No growth means no growth was detected under the test conditions. It does not prove every unit is sterile or establish an endotoxin result. A routine microbial count is not equivalent to a sterility test.

Sterility assurance also depends on controlled manufacturing, validated processing, and container-closure integrity throughout shelf life. A passing sample test cannot replace those controls. Testing incoming bulk material leaves later filling and packaging unassessed. Some regulated, terminally sterilized medicines have authorized parametric release arrangements; missing test results alone do not establish that such arrangements exist. [FDA, Production and Process Controls](<https://www.fda.gov/drugs/guidances-drugs/questions-and-answers-current-good-manufacturing-practice-regulations-production-and-process>).

9. Other impurities. Depending on manufacturing and formulation, relevant tests can include residual solvents, elemental impurities, water, counterions, aggregates, and degradation products. A short COA is not automatically fraudulent, but its omissions define what remains unknown. Janvier documented elemental contamination, illustrating why peptide purity alone cannot address every quality attribute. Janvier, 2018, Talanta, PMID 30029448.

10. Laboratory and authorization. Find the laboratory's legal name, location, report number, authorized signatory, and amendment history. Verify the report through contact information obtained independently. A QR code returning to a seller-controlled page establishes neither laboratory authorship nor report authenticity.

For an accreditation claim, verify the current certificate and scope with the issuing accreditation body. ISO/IEC 17025 accreditation concerns laboratory competence within an identified scope; it does not approve the product. Confirm that the relevant site and testing activities are covered. A generic certification logo is insufficient. [International Laboratory Accreditation Cooperation, Frequently Asked Questions](<https://ilac.org/about-ilac/faqs/>).

Third-party versus in-house testing

In-house testing can be technically strong when methods, equipment, personnel, standards, and quality systems are controlled. Its commercial relationship should remain visible. An external laboratory may perform the analytical work, but that arrangement does not automatically establish independent sampling or freedom from conflicts of interest.

Ask who selected the units, how they were sealed, who transported them, and whether the laboratory recorded receipt condition. A seller-selected sample may not represent shipped stock. Independent sampling and documented custody strengthen the connection between a report and inventory, without eliminating sampling uncertainty.

Repeated lot-specific results are more informative than one favorable report reused indefinitely. Different methods should tell a coherent story about identity, amount, and impurities. Contradictory results require investigation, not averaging into a reassuring conclusion. Report authenticity and sample representativeness remain separate questions.

COA READING CHECKLIST

- Product name, sequence, modifications, and molecular form agree.
- Container lot matches the report or has a documented batch link.
- Sample type and receipt, test, and issue dates are stated.
- HPLC includes method, chromatogram, result, and acceptance limit.
- Mass spectrometry reports expected and observed identity data.
- Peptide amount has a quantitative method and defined mass basis.
- Endotoxin includes units, reporting limit, criterion, and suitability.
- Sterility claims have documented finished-product assurance.
- Other relevant impurities and stability limitations are disclosed.
- Laboratory identity, report authenticity, and claimed accreditation scope are verified.
- Sampling responsibility and custody are documented.
- Missing information is recorded as unknown, never assumed to pass.

Ten red flags for falsification or quality failure

1. The COA has no lot identifier, or its identifier cannot be connected to the delivered container.
2. Identical analytical traces recur across supposedly different lots without a documented explanation from the laboratory.
3. The named laboratory disputes the report, or its identity cannot be established through independently obtained contact information.
4. The report advertises purity but omits methods, numerical results, or supporting analytical records.
5. The identity result conflicts with the stated sequence, modification, or molecular form.
6. The labeled peptide amount is inferred only from gross powder weight or HPLC area percentage.
7. A sterile or endotoxin-controlled claim appears without corresponding evidence.
8. Seals are damaged, liquid has leaked, or appearance differs from the documented specification.
9. Shipping conditions exceed documented limits and no stability-based assessment addresses the excursion.
10. Requests for clarification trigger pressure, changing explanations, unverifiable clearance fees, or refusal to provide records.

A red flag identifies a reason to investigate or stop the assessment; it does not always establish fraud. Powder appearance can vary with formulation and drying. Conversely, normal appearance cannot exclude degradation or contamination. Sensations and perceived effectiveness cannot authenticate a product.

Documentation scorecard: ten criteria, 100 points

This fixed scorecard addresses documentation for products presented as sterile finished preparations. It is not a universal ranking of research reagents or nonsterile formulations. Score the specific lot: full weight for complete, independently checkable evidence; half for material but incomplete evidence; zero for absent, contradictory, or unverifiable evidence. Preserve half-points. Weights and thresholds are editorial, not validated risk estimates.

CRITERION	WEIGHT	EVIDENCE FOR FULL POINTS
Batch and sample traceability	15	Container, filling lot, manufacturing batch, and tested sample have a documented connection, with sampling responsibility and custody recorded.
Chemical identity	12	Appropriate identity methods support the stated molecule and relevant modifications.
Purity and impurity coverage	12	Interpretable chromatography and relevant additional impurity tests have defined limits.
Peptide amount and uniformity	12	Quantitative finished-unit content, mass basis, and unit variability are documented.
Endotoxin evidence	12	Lot-specific testing includes method suitability, units, reporting limit, and a criterion justified for the stated pharmaceutical context.
Sterility assurance	10	Finished-product assurance includes validated processing, container-closure controls, and applicable sterility testing or documented regulatory authorization for parametric release.
Laboratory competence and authenticity	10	Report verification, relevant competence, and any claimed accreditation scope are confirmed.
Stability and distribution	7	Storage, shelf life, transport limits, and excursion handling have supporting evidence.
Supply-chain transparency	5	Responsible entities and manufacturing, filling, and distribution roles are identifiable.

CRITERION	WEIGHT	EVIDENCE FOR FULL POINTS
Complaint and corrective-action process	5	Written procedures address discrepancies, investigations, affected lots, and resolution.

SCORE	DOCUMENTATION ASSESSMENT
90 to 100	Strong documentation within this framework, subject to every critical gate.
75 to less than 90	Material gaps remain and require resolution.
60 to less than 75	Weak documentation leaves substantial uncertainty.
Below 60	Documentation is insufficient for a credible quality assessment.

Critical gates override the score: suspected falsification, unresolved lot or identity mismatch, failed specifications, unsupported sterility claims, and unresolved transport excursions. Missing required microbial evidence earns zero. Legitimate nonsterile research materials fall outside this scorecard's scope; absent sterility testing alone does not establish misconduct. No score authorizes human use or substitutes for regulatory oversight.

Price sanity without invented market prices

Price comparisons require equivalent material: the same molecule, chemical form, verified peptide amount, formulation, testing scope, and shipping conditions. Comparing container prices without those details can obscure underfilling or missing quality controls. Price is contextual information, not an analytical measurement.

- Near the median of genuinely comparable, documented quotations, price is broadly ordinary but quality remains unproven.
- Far below the comparable range, an unexplained difference remains a documentation question.
- Far above the comparable range, additional value requires evidence of relevant controls or other documented differences.
- If documentation cannot establish comparable quotations, the price range remains unknown.

These are editorial screening rules, not measured industry thresholds. There is no evidence-based universal discount that proves fraud or premium that guarantees quality. Claims of unusually expensive testing should correspond to authentic reports, relevant methods, and representative sampling.

Shipping, temperature, and the cold chain

Stability depends on the particular peptide, formulation, container, moisture exposure, and physical state. Lyophilized and liquid materials can have different requirements. Chemical and physical characterization informs product-specific stability assessment. A general review cannot establish a universal storage temperature or shelf life for every peptide. D'Addio, 2016, Journal of pharmaceutical sciences, PMID 27499338.

Relevant documentation includes the supported shipping range, permitted excursion duration, packaging qualification, and process for evaluating delays. A cold pack shows that cooling was attempted. It does not reconstruct the shipment's temperature history. Monitoring records are more informative when temperature control is required.

Warm delivery does not automatically prove degradation if product-specific stability data support that exposure. Cold delivery does not establish compliant handling throughout transit. Unexpected freezing may also matter for some formulations. An excursion requires assessment against applicable stability data, not touch, weather, or generic reassurance.

An unexplained shipping delay warrants a documented assessment. Returning material to its stated storage condition does not establish that prior damage has been reversed. If stability information is unavailable, the condition remains unresolved. A plausible explanation for a delay is not evidence of preserved quality.

What to document on arrival

1. Photograph the outer package, internal packaging, labels, seals, and visible damage before discarding packing materials.
2. Record arrival date, shipment identifier, product identity, quantity, lot numbers, expiry or retest dates, and supplied documents.
3. Compare each container with the COA and document any bulk-to-finished-lot mapping.
4. Save temperature-monitoring data when available and record delays or other apparent excursions.
5. Inspect unopened containers for leakage, damaged closures, and discrepancies from the documented appearance specification.
6. Keep questionable material sealed and segregated while obtaining a written investigation.
7. Retain authenticated product-specific storage instructions and associated records with the material.

Missing or contradictory instructions leave storage requirements unresolved. A universal refrigeration or freezing plan is not justified by the peptide category alone. Opening a container changes its exposure history and cannot establish purity, identity, or sterility. Unnecessary handling can also compromise later investigation.

Message template for requesting documentation

Subject: Lot-specific analytical documentation request

Hello,

Please provide the complete COA and supporting reports for the specified material and lot.

Please include:

Exact chemical identity, molecular form, and modifications.

Manufacturing batch, finished lot, and their documented relationship.

Sample type, sampling responsibility, custody, and receipt and testing dates.

HPLC method, chromatogram, numerical purity, and acceptance limit.

Mass spectrometry identity results and relevant complementary testing.

Measured peptide amount per unit, mass basis, and uniformity data.

Endotoxin method, units, reporting limit, criterion, and suitability when applicable.

Sterility testing and processing evidence if sterility is claimed.

Relevant additional impurity results and supported storage and shipping limits.

Laboratory legal name, report identifier, and accreditation scope if claimed.

Please identify tests not performed and distinguish bulk testing from finished-unit testing. Please authorize the laboratory to confirm report authenticity directly.

Please also explain the written process for investigating lot discrepancies and shipping excursions.

Thank you.

When to end the assessment

The assessment cannot establish quality when essential records remain unavailable, the laboratory disputes the report, or identifiers cannot be reconciled. A failed specification requires a documented investigation. A replacement offer can resolve a transaction without explaining the original failure. Preserved evidence keeps that discrepancy visible in the record.

For athletes, analytical quality does not change anti-doping status. BPC-157 is prohibited at all times under S0 of the 2026 WADA Prohibited List. A COA cannot establish permission to use a prohibited substance. [WADA,

Record unresolved identity, quantity, contamination controls, or storage history explicitly. Reviews, discounts, normal appearance, and polished documentation cannot fill those evidence gaps.

REFERENCES

1. Janvier S et al. Impurity profiling of the most frequently encountered falsified polypeptide drugs on the Belgian market.. *Talanta*, 2018. PMID 30029448 DOI 10.1016/j.talanta.2018.06.023 (Analytical study documenting variable drug content, peptide impurities, and elemental contamination in sampled falsified polypeptide drugs. Supports assessing multiple quality attributes. Does not establish defect prevalence across the entire market or clinical outcomes.)
2. Ashraf AR et al. Safety and Risk Assessment of No-Prescription Online Semaglutide Purchases.. *JAMA network open*, 2024. PMID 39093567 DOI 10.1001/jamanetworkopen.2024.28280 (Small online test-purchase study documenting three received orders out of six, purity discrepancies, active content exceeding labeled amounts, and elevated endotoxin in one sample despite no detected viable microorganisms. Does not establish market-wide prevalence or patient outcomes.)
3. McCarthy D et al. Reference Standards to Support Quality of Synthetic Peptide Therapeutics.. *Pharmaceutical research*, 2023. PMID 36949371 DOI 10.1007/s11095-023-03493-1 (Describes complementary methods for peptide reference-standard identity, purity, content assignment, content uniformity, and stability. Discusses mass-balance value assignment and limitations involving chiral or isobaric amino acids. Supports analytical principles, not therapeutic efficacy or certification of commercial research materials.)
4. Nicolás Carcelén J et al. Evaluation of different isotope dilution mass spectrometry strategies for the characterization of naturally abundant and isotopically labelled peptide standards.. *Analytical and bioanalytical chemistry*, 2024. PMID 38363304 DOI 10.1007/s00216-024-05176-1 (Experimental characterization of peptide standards using amino acid analysis and isotope dilution mass spectrometry. Supports the need for validated quantitative methods and traceable reference materials. Does not validate the hypothetical material quantities or any administration dose.)
5. D'Addio SM et al. New and Evolving Techniques for the Characterization of Peptide Therapeutics.. *Journal of pharmaceutical sciences*, 2016. PMID 27499338 DOI 10.1016/j.xphs.2016.06.011 (Review of chemical and biophysical characterization of peptide drug products, including formulation development, stability, and critical quality attributes. Does not establish a universal storage temperature, shipping range, or shelf life.)

The vendor scorecard

Score each criterion from 0 to its weight. Total 100. The same scorecard is interactive in the UU Life app.

CRITERION	WEIGHT	SCORE
Batch and sample traceability Container, filling lot, manufacturing batch, and tested sample have a documented connection, with sampling responsibility and custody recorded.	15	
Chemical identity Appropriate identity methods support the stated molecule and relevant modifications.	12	
Purity and impurity coverage Interpretable chromatography and relevant additional impurity tests have defined limits.	12	
Peptide amount and uniformity Quantitative finished-unit content, mass basis, and unit variability are documented.	12	
Endotoxin evidence Lot-specific testing includes method suitability, units, reporting limit, and a criterion justified for the stated pharmaceutical context.	12	
Sterility assurance Finished-product assurance includes validated processing, container-closure controls, and applicable sterility testing or documented regulatory authorization for parametric release.	10	
Laboratory competence and authenticity Report verification, relevant competence, and any claimed accreditation scope are confirmed.	10	
Stability and distribution Storage, shelf life, transport limits, and excursion handling have supporting evidence.	7	
Supply-chain transparency Responsible entities and manufacturing, filling, and distribution roles are identifiable.	5	
Complaint and corrective-action process Written procedures address discrepancies, investigations, affected lots, and resolution.	5	
Total	100	

BAND	VERDICT
90 to 100	Strong documentation within this framework, subject to every critical gate.
75 to less than 90	Material gaps remain and require resolution.
60 to less than 75	Weak documentation leaves substantial uncertainty.
Below 60	Documentation is insufficient for a credible quality assessment.

No COA, no order.

The scorecard is in the app. Keep the lot number with every vial.

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