



LEGAL PROTECTION FOR CONSUMERS THROUGH LEGAL METROLOGY IN TRADE ACTIVITIES

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ARTICLE INFO	ABSTRACT
<p>Keywords: Consumer Protection; Legal Metrology; Trade; Legal Certainty; Measurement Standardization; Consumer Rights.</p>	<p>This article aims to analyze the legal protection for consumers through legal metrology in trade activities. Legal metrology plays a crucial role in ensuring fairness in trade, particularly for consumer rights. This study employs a normative legal research method to examine relevant regulations and legal principles. The findings indicate that consumer protection through legal metrology in trade is regulated under the Legal Metrology Law. In every transaction involving measurements, only measuring, weighing, and counting instruments that are certified and guaranteed accurate may be used. Efforts to ensure consumer protection include: 1) providing technical and legal certainty for measuring instruments and their auxiliary tools; 2) enhancing standardization, empowering consumers, supervising the circulation of goods and services, ensuring measurement compliance, and monitoring the quality of goods and services. Consumer protection through legal metrology takes two forms: preventive protection, which focuses on avoiding potential violations, and repressive protection, which provides remedies when violations occur. These efforts are integral to fostering trust and fairness in commercial transactions, ensuring that consumers' rights are upheld and safeguarded effectively.</p>

A. INTRODUCTION

The development of the national economy should facilitate the expansion of business activities that generate goods and services, aiming to enhance overall societal welfare and ensure reliability in the availability and quality of those goods and services. Trading activities must still pay attention to the rights and protection of consumers as users of these goods and services. Business actors are required to increase knowledge and awareness

as well as a responsible attitude by prioritizing aspects of consumer protection.¹

Consumer-related matters have become a significant concern in modern society, as every individual functions as a consumer who requires protection against the potential risks associated with the quality of goods and/or services offered by producers.² In fulfilling the need for goods and/or services, society, particularly consumers, represents a group vulnerable to manipulation in measurement, weighing, and scaling. In this regard, consumers, as users of goods and/or services, should receive legal protection. As stipulated in consumer protection laws, the public, particularly consumers, must be guaranteed legal certainty to ensure their protection.³

Consumer protection refers to the measures established under regulatory frameworks to safeguard consumer rights. It serves as a fundamental prerequisite for achieving a stable and healthy economy by maintaining an equitable balance between the interests of consumers and those of business entities.⁴ Consumer protection regulations cover various areas, including food and beverages, drugs and hazardous materials, cosmetics, electronic devices, motor vehicles, industrial products, quality control of goods, environmental protection, and metrology. This discussion specifically focuses on the aspects of legal protection related to metrology, with an emphasis on legal metrology in trade.

According to Black's Law Dictionary⁵, legal metrology refers to: "The branch of metrology that deals with units of measurement and the instruments used for measuring and weighing as they relate to legal requirements." This field ensures that measurements used in trade, health, safety, and environmental protection comply with regulations to ensure fairness and accuracy. It encompasses aspects such as calibration,

¹ Florianus Yudhi Priyo Amboro and Lily Persyadayani, "Efektivitas Pelaksanaan Pengawasan Metrologi Legal Terhadap Peningkatan Retribusi Daerah Di Kota Tanjungpinang," *Journal of Law and Policy Transformation* 6, no. 1 (2021), <https://doi.org/10.37253/jlpt.v6i1.4948>.

² Zulfi Chairi, Puspa Melati, and Aflah Aflah, "Pembentukan Kelompok Sadar Hukum Dan Penyuluhan Hukum Bagi Perempuan Terhadap Hak-Hak Sebagai Konsumen Menurut Undang-Undang Perlindungan Konsumen (Lokasi: Desa Batang Kuis Pekan Dan Desa Mesjid Kecamatan Batang Kuis Kabupaten Deli Serdang)," *Jurnal Abdimas Talenta* 2, no. 2 (2017), <https://talenta.usu.ac.id/abdimas/article/view/2313>.

³ Mohamad Arif Asiari, Fenty U. Puluhulawa, and Julius T. Mandjo, "Pelaksanaan Tera/Tera Ulang Oleh Metrologi Legal Dinas Perdagangan Dan Perindustrian Kota Gorontalo Sebagai Upaya Perlindungan Konsumen," *Aliansi Jurnal Hukum, Pendidikan, Dan Sosial Humaniora* 1, no. 3 (2024), <https://doi.org/10.62383/aliansi.v1i3.172>.

⁴ Gunawan Sri Guntoro and Mien Rukmini, "Penegakan Hukum Pidana Oleh Pengawas Kemetrolagian Terhadap Manipulasi Pompa Ukur Bahan Bakar Minyak Berdasarkan Undang-Undang Nomor 2 Tahun 1981 Tentang Metrologi Legal Dalam Rangka Perlindungan Konsumen," *Iustitia Omnibus Jurnal Ilmu Hukum* 1, no. 2 (2020), <http://journal.unla.ac.id/index.php/iustitia/article/view/1638>.

⁵ "Black's Law Dictionary, 12th Edition" (Thomson West, 2024).

certification, and monitoring of measuring instruments like scales, meters, and gauges to maintain compliance with legal standards.

According to Euramet, metrology—also known as the science of measurement—is a discipline that examines the principles and techniques of measurement, calibration, and precision across various fields, including industry, science, and technology. Metrology according to Euramet consists of three main categories with different levels of complexity and accuracy, firstly Scientific Metrology: related to how to regulate, develop references to the basics of measurement and maintenance. Second, Industrial Metrology: aims to make sure that measurement systems and measuring instruments in the industry function properly according to predetermined standards, both in the pre-production process, during production and testing. Third Legal Metrology as part of the methodology related to activities related to measurement, measuring instruments, measurement methods in terms of buying and selling transactions, health, safety.⁶

Every nation maintains a robust measurement framework tailored to its national quality infrastructure needs, comprising a network of laboratories, standardized facilities, and accreditation authorities. In Indonesia, the legal metrology system is administered by the Directorate of Metrology under the Directorate General of Consumer Protection and Trade Compliance within the Ministry of Trade. This Directorate oversees the regulation, monitoring, and enforcement of legal metrology standards in alignment with relevant legislation, including Law No. 2 of 1981 on Legal Metrology.

Legal metrology is the third category of metrology that originally arose to ensure fairness in trade, particularly in the area of weighing and measuring. The main objective of legal metrology is to provide certainty in terms of the accuracy of measurements for the public, whether measurements are made in official transactions, trade transactions, related to the environment, occupational health and safety. According to John Birch the important role of Legal Metrology is to reduce transaction costs and ensure that the products produced comply with the agreed basic rules and quality standards. Related to this, it is unknowingly that legal metrology is a very important part of the needs of everyday human life. Primary human needs such as clothing, food, boards use weight or size in buying and selling affairs. In household needs including water, electricity, and gas must be

⁶ Dine Evantara and Irfan Ridwan Maksum, "Perbandingan Urusan Metrologi Legal Indonesia Dan Belanda," *Jurnal Administrasi Publik: Public Administration Journal* 9, no. 2 (2019), <http://dx.doi.org/10.31289/jap.v9i2.2551>.

measured. In the world of health, including the amount of chemicals in medicines, measurement of blood samples and the use of medical devices.⁷

In everyday life, consumers are directly involved with measurements, such as when refueling, receiving electricity bills, water bills, telephone bills, or using internet credit. These measurements are often difficult for consumers to verify independently. The reliability and uniformity of measurements can only be ensured through regulatory oversight by the state or government. Such standards are designed to promote a fair and transparent marketplace, particularly in safeguarding consumer interests.⁸

A frequent legal infraction within the trade sector involves violations of legal metrology standards. Numerous instances in the marketplace, particularly in the goods trade, reveal that consumers often unknowingly pay more than the actual quantity of goods received. This typically occurs due to tampered measuring instruments, which have been altered to display inaccurate measurements that do not reflect the true amount.⁹ The reality in society is that there are often fraudulent acts committed by business actors in selling goods, for example by reducing the number of scales that should or should not be in accordance with what is stated on the product label.¹⁰ This is of course very detrimental to consumers because the positions of business actors and consumers are unequal so that consumers are in a weak position.

These problems have become problematic in the world of commerce, legal norms have been created, law enforcement officers already exist, but public awareness is still weak, to anticipate violations of legal metrology by traders so as not to harm consumers of course legal protection is needed to protect society as well as to create fair economic competition. healthy in the world of commerce. Based on the description, this research aims to examine how consumer protection is implemented through legal metrology in trade, given the critical importance of legal metrology regulations in ensuring fairness and safeguarding consumer rights in commercial activities.

⁷ Evantara and Ridwan Maksum, "Perbandingan Urusan Metrologi Legal Indonesia Dan Belanda."

⁸ Inosentius Samsul, "Penegakan Hukum Perlindungan Konsumen Melalui Penyelenggaraan Metrologi Legal Dalam Era Otonomi Daerah," *Negara Hukum: Membangun Hukum Untuk Keadilan Dan Kesejahteraan* 6, no. 2 (2015), <https://dprexternal3.dpr.go.id/index.php/hukum/article/view/253>.

⁹ Debora Morina Br Barus, Syawal Amry Siregar, and Maurice Rogers, "Penerapan Undang-Undang Nomor 2 Tahun 1981 Tentang Metrologi Legal Pada Dinas Perindustrian Dan Perdagangan Kabupaten Karo," *Jurnal Retentum* 3, no. 1 (2022), <https://jurnal.darmaagung.ac.id/index.php/retentum/article/view/1364>.

¹⁰ Samsul, "Penegakan Hukum Perlindungan Konsumen Melalui Penyelenggaraan Metrologi Legal Dalam Era Otonomi Daerah."

B. RESEARCH METHODS

The research method used is normative juridical legal research, which is library research by reviewing literature related to the object under study. In normative legal research, the objects of study are norms, specifically norms that regulate legal metrology to create order in the world of trade. This research will examine several regulations related to legal metrology and consumer protection in trade, including: Law Number 8 of 1999 on Consumer Protection, Law Number 2 of 1981 on Legal Metrology, Government Regulation Number 2 of 1985; and Minister of Trade Regulations related to trade order and the supervision of goods and services. The design of this research is descriptive-analytical, which aims to provide a clear picture of the application of legal metrology in consumer protection in the trade world. This research will deeply explore the related regulations and analyze their relevance to consumer protection within the legal context in Indonesia.

This study uses both a statutory approach and a conceptual approach. The statutory approach is used to examine and analyze all the laws and regulations related to the object being studied, namely the regulations on consumer protection through legal metrology in trade. The conceptual approach is used to review the concept of legal protection that provides legal certainty and protection to the public. The analysis used is qualitative analysis, where the data is analyzed by providing descriptions of the findings to answer the research problem. The research results are presented in a descriptive narrative form.

C. DISCUSSION

1. Legal Metrology Regulations in Efforts to Protect Consumers through Trade Activities

The regulation of legal metrology is outlined in Law No. 2 of 1981 concerning Legal Metrology. The primary aim of this law is to safeguard public interests by ensuring the accuracy of measurements, as well as establishing order and legal certainty in the use of measurement units, standard units, measurement methods, measuring instruments, as well as scales, weights, and related equipment.

In the context of accelerating the establishment of the Legal Metrology Unit in the framework of implementing calibration, re-calibration and supervision of legal metrology, it is necessary to rearrange the provisions regarding legal metrology units, these rules are set forth in the Regulation of the Minister of Trade of the Republic of Indonesia Number 115 of 2018

concerning Legal Metrology Units.¹¹ The Minister of Trade Regulation defines Legal Metrology as the branch of metrology that governs the units of measurement, measurement methods, and measuring instruments in accordance with technical standards and legal regulations, with the goal of safeguarding public interests by ensuring the accuracy of measurements.

Basically, metrological arrangements in Indonesia are regulated in Law Number 2 of 1981 and various derivative laws and regulations, including:

- 1) Government Regulation No. 2 of 1985 addresses the obligations and exemptions related to calibration and/or re-calibration, as well as the requirements for measurement and weighing instruments and their associated equipment.¹²
- 2) Government Regulation Number 10 of 1987 concerning derivative units, additional units and other applicable units.¹³

Legal Metrology Regulations are also related to other laws, including:

- 1) Law No. 23 of 2014 pertains to the governance of regional administrations.

The responsibility for overseeing Legal Metrology and Calibration or Recalibration Services is vested in the Regency or Municipal Government. Therefore, each district or city is required to establish a Legal Metrology Unit to ensure the effective implementation of Legal Metrology supervision.¹⁴

- 2) Law No. 8 of 1999 addresses the protection of consumer rights.

Law No. 8 of 1999 on Consumer Protection governs the rights and

¹¹ Republik Indonesia, "Peraturan Menteri Perdagangan Nomor 115 Tahun 2018 Tentang Unit Metrologi Legal" (2018).

¹² Republik Indonesia, "Peraturan Pemerintah (PP) Nomor 2 Tahun 1985 Tentang Wajib Dan Pembebasan Untuk Ditera Dan/Atau Ditera Ulang Serta Syarat-Syarat Bagi Alat-Alat Ukur, Takar, Timbang, Dan Perlengkapannya" (1985), <https://peraturan.bpk.go.id/Details/64421/pp-no-2-tahun-1985>.

¹³ Republik Indonesia, "Peraturan Pemerintah (PP) Nomor 10 Tahun 1987 Tentang Satuan Turunan, Satuan Tambahan, Dan Satuan Lain Yang Berlaku" (1987), <https://peraturan.bpk.go.id/Details/64046/pp-no-10-tahun-1987>.

¹⁴ Sri Guntoro and Rukmini, "Penegakan Hukum Pidana Oleh Pengawas Kemetrolagian Terhadap Manipulasi Pompa Ukur Bahan Bakar Minyak Berdasarkan Undang-Undang Nomor 2 Tahun 1981 Tentang Metrologi Legal Dalam Rangka Perlindungan Konsumen."

responsibilities of both consumers and business actors, as well as the government's role in ensuring consumer protection.¹⁵

3) Law No. 7 of 2014 relates to trade regulations and policies.

The provisions outlined in Law No. 7 of 2014 are intended to promote national economic growth and are founded on key principles such as national interest, legal certainty, fairness and healthy competition, business security, accountability and transparency, independence, partnership, public benefit, simplicity, solidarity, and environmental sustainability.¹⁶

4) Law No. 20 of 2014 pertains to standardization and conformity assessment frameworks.

The Law concerning Standardization and Conformity Assessment contains main materials which include institutions, Standardization, Conformity Assessment, cooperation, community participation, guidance, supervision, and information systems for Standardization and Conformity Assessment carried out based on the principles of: benefit; consensus and openness; effective and relevant; coherent; dimensions of national development; and competent and organized.¹⁷

From this description it can be emphasized that consumer protection regulations related to legal metrology have been regulated in Law Number 2 of 1981 and are also related to other laws and regulations. The purpose of forming a law is in the framework of law enforcement to realize justice. The law on legal metrology guarantees fairness in trade transactions between consumers and business actors.

2. Scope of Legal Metrology Regulations in Consumer Protection through Trade Activities

The structure of Legal Metrology Regulations in Law Number 2 of 1981

¹⁵ Republik Indonesia, "Undang-Undang (UU) Nomor 8 Tahun 1999 Tentang Perlindungan Konsumen" (1999), <https://peraturan.bpk.go.id/Details/45288/uu-no-8-tahun-1999>.

¹⁶ Republik Indonesia, "Undang-Undang (UU) Nomor 7 Tahun 2014 Tentang Perdagangan" (2014), <https://peraturan.bpk.go.id/Details/38584/uu-no-7-tahun-2014>.

¹⁷ Republik Indonesia, "Undang-Undang (UU) Nomor 20 Tahun 2014 Tentang Standardisasi Dan Penilaian Kesesuaian" (2014), <https://peraturan.bpk.go.id/Details/38663>.

includes several key components. It begins with general provisions, followed by sections on units and unit standards. The regulations also cover tools for measuring, measuring, weighing, and their accessories, as well as provisions regarding tera marks and wrapped goods. Additionally, it outlines prohibited acts, criminal provisions, and rules for supervision and investigation. The law concludes with transitional rules and closing provisions, ensuring comprehensive coverage of legal metrology.¹⁸

The regulatory aspects in Law Number 2 of 1981 encompass several key elements. These include units of measurement, unit standards, and the testing and marking of Measuring Instruments and their Equipment (*Alat-alat Ukur, Takar, Timbang dan Perlengkapannya*/UTTP). Additionally, the law addresses tera marks and Packaged Goods (*Barang Dalam Keadaan Terbungkus*/BDKT). It also outlines prohibited acts, such as the circulation and use of measuring devices and units of measurement that do not comply with the provisions, as well as the distribution of BDKT that violates established regulations.

According to Law No. 2 of 1981, legal metrology refers to the branch of metrology responsible for regulating measurement units, measurement methods, and measuring instruments in accordance with technical standards and legal provisions, with the objective of safeguarding public interests by ensuring measurement accuracy.

The correctness of measurement is very important in providing consumer protection. In order to guarantee legal certainty of the correctness of measurement, a National Standard of Measurement Units is required. The National Standard for Measurement Units is a very important supporting tool for ensuring the correctness of measurements or standard values as a comparison for measuring instruments, measures, weights, and their equipment to protect public interest.

Unit Standards are regulated in Law Number 2 of 1981, the setting of National Standards for Units of Measurement is further regulated in

¹⁸ Republik Indonesia, "Undang-Undang Republik Indonesia Nomor 2 Tahun 1981 Tentang Metrologi Legal" (1981).

Government Regulation of the Republic of Indonesia Number 2 of 1989 concerning National Standards for Units of Measurement. Furthermore, legal metrology measurement standards are regulated in the Regulation of the Minister of Trade Number 52 of 2019 concerning Legal Metrology Measurement Standards.

Article 12 of Law No. 2 of 1981 stipulates that measuring instruments, measures, weights, and their associated equipment must undergo calibration and re-calibration. This requirement is further detailed in Minister of Trade Regulation No. 67 of 2018, which specifies the types of measuring, dosing, and weighing instruments and equipment subject to mandatory calibration and re-calibration.

Regulation of the Minister of Trade Number 52 of 2019 Concerning Legal Metrology Measurement Standards has an important role to ensure the correctness of measurements in the implementation of legal metrology, it is also important to set standard sizes to be used in the implementation of legal metrology activities.

The Metrology Law defines the following fundamental units: meter as the base unit for length; kilogram for mass; second for time; ampere for electric current; kelvin for thermodynamic temperature; candela for luminous intensity; and mole for the amount of substance. The symbol for the unit of measure is symbolized as listed in the following Table 1:

Table 1. Unit Symbol

N o	Unit	Unit Symbol
1	Meter	M
2	Kilogram	Kg
3	Sekon	S
4	Ampere	A
5	Kelvin	K
6	Kandela	Ed
7	Mole	Mol

These unit standards have been regulated in the Metrological Law, further regulated in Law Number 2 of 1989 concerning National Standards for Units of Measure. The National Standard for Units of Measure is a very important supporting tool in order to achieve certainty of the correctness of measurements or standard values as a comparison of measuring instruments, measures, weights and their equipment to protect the public interest.

3. Consumer Protection through the Application of Legal Metrology in Trade Activities

Legal metrology includes all activities related to the implementation of legal requirements regarding measurement, units of measurement, measuring instruments and measuring methods. These activities are carried out by or on behalf of government authorities to ensure a reasonable level of credibility of measurement results in areas required by the government.¹⁹

Implementation of legal metrology is one of the consumer protections instruments. Standards and measurements that are the object of regulation of legal metrology. The responsibility for establishing accurate measurement standards rests with the government through legal metrology instruments.²⁰ Business actors and/or traders should know about metrology, measuring instruments, the Consumer Protection Act, the Legal Methodology Law, and Government Regulations related to labels, advertisements and food so that the assurance of the quality of goods is maintained and consumers are not harmed.²¹

Efforts to protect consumers through legal metrology in trade include: 1) ensuring technical certainty and legal certainty for Measuring, Weighing Equipment and their equipment; 2) through increasing standardization, empowering consumers, supervising circulating goods and/or

¹⁹ "Naskah Akhir Penyelenggaraan Naskah Akademik Rancangan Undang-Undang Tentang Metrologi" (2016), https://www.bphn.go.id/data/documents/na_ruu_metrologi.pdf.

²⁰ Samsul, "Penegakan Hukum Perlindungan Konsumen Melalui Penyelenggaraan Metrologi Legal Dalam Era Otonomi Daerah."

²¹ Budi Yasri, "Studi Tentang Tingkat Pemahaman Dan Kesadaran Pedagang Terhadap Ketentuan Tertib Niaga: Metrologi Legal, Perlindungan Konsumen, Dan Label Iklan Pangan Studi Kasus Pedagang Pasar Tradisional Balubur Townsquare (Baltos) Kota Bandung," *Decision: Jurnal Administrasi Publik* 2, no. 2 (2020), <https://journal.unpas.ac.id/index.php/decision/article/view/3143>.

services, orderly measuring and controlling the quality of goods and/or services. Inclusion of labels on packaged products, both goods and food products, must be stated according to the actual measure or weight. This is a form of consumer protection as stipulated in article 22 paragraph (1) of Law Number 2 of 1981 concerning Legal Metrology.

All goods in a packaged condition which are circulated, sold, offered or exhibited must be notified or stated on the package or on the label in short, correct and clear writing concerning: a) the name of the goods in the package; b) the size, contents or net weight of the goods in the package with the unit or symbol as referred to in Article 4, Article 5 and Article 7 of this Law; c) the number of goods in the package if the goods are sold by calculation.

Employees who are entitled to calibrate and re-calculate UTTP are Civil Servants who serve in the Metrology Unit at the Legal Metrology Unit, have passed education and training as Assigners who are given the right by the Minister to carry out tera and/or re-calibration of UTTP. The employee is to carry out standard management by taking an oath to carry out standard and laboratory management, calibrate and or re-calibrate UTTP and supervise UTTP and BDKT, as well as metrological counseling. Menera is a matter of marking with a valid mark or valid invalid calibration mark, or providing written statements which are validly signed or invalid valid calibration mark. Meanwhile, the re-calibration activity is a matter of marking periodically with valid or invalid valid calibration signs.



Figure 1. Types of Marks

Supervision of UTTP and BDKT is regulated in Minister of Home Affairs Regulation (*Peraturan Menteri Dalam Negeri/Permendagri*) Number 71/M-

DAG/PER/10/2014 concerning Supervision of Measuring, Weighing Equipment, and their Equipment, Wrapped Goods, and Units of Measure. Supervision is a series of activities to ensure UTPP, BDKT, and Measurement Units comply with statutory provisions carried out by metrological supervisors. Supervision is a legal action to ensure that the object being supervised complies with laws and regulations and runs according to legally valid procedures.²²

The definition of supervision according to Lyndal Urwick, supervision is an effort to make something carried out in accordance with the rules that have been set and the instructions issued. According to Henry Fayol, supervision is a provision in testing any agreement, which is adjusted to the instructions and principles of implementation, which is no longer possible to be denied.

Supervision regarding the correctness of measurement results in trade in goods and services is very important for the interests of consumers. Consumers always want a guarantee of the correctness of the measurement results of the trade transaction process, both transactions that UTPP as the basis for determining the quantity and price of goods/services as well as BDKT whose quantity is stated on the packaging label. Such supervision is an effort to protect consumers in the form of preventive protection in addition to repressive protection. However, preventive protection should be prioritized to provide legal certainty for consumer protection.

The aspect of criminal law is a means to enforce consumer protection in a repressive manner, namely by setting prohibitions related to the circulation and use of measuring devices and units of measurement that do not comply with the provisions and distribution of BDKT that do not comply with the provisions. Article 32 paragraph (1) of Law Number 2 of 1981 confirms that whoever violates the relevant law is subject to imprisonment for a maximum of 1 year or a fine of Rp. 1 million.

²² Edy Nurcahyo, "Pengaturan Dan Pengawasan Produk Pangan Olahan Kemasan," *Jurnal Magister Hukum Udayana (Udayana Master Law Journal)* 7, no. 3 (2018), <https://doi.org/10.24843/jmhu.2018.v07.i03.p10>.

Legal metrological crime is an ordinary crime, because if seen from the criminal threat it is only 1 (one) year.²³ If the case is included in the court, then the process is in the form of a short sentence, that is, the trial process is carried out briefly. Where the judge will give sanctions in accordance with the laws that govern it. While administrative sanctions are additional administrative sanctions.²⁴ In a theory of legal protection, legal protection is divided into preventive legal protection and repressive protection, the imposition of sanctions both criminal sanctions and administrative sanctions is a form of repressive legal protection. While supervision is a form of preventive protection to prevent violations of the law.

D. CONCLUSION

The conclusion drawn from this research indicates that the regulations governing Legal Metrology aim to protect public interest, which aligns with consumer protection. Legal metrology regulations play a crucial role in consumer protection in the world of commerce, as legal metrology instruments provide guarantees of certainty and fairness in every trade transaction. However, the research also reveals that the mere existence of regulations is not sufficient to ensure effective consumer protection. Strict supervision and consistent enforcement of legal metrology laws are required to guarantee consumer protection in trade. The implications of these findings emphasize the importance of enhancing the supervisory capacity of authorities and educating both business actors and consumers about the importance of using legally certified and standardized measuring instruments, in order to create a fairer and more transparent trading environment.

²³ Wenny Megawati, "Kebijakan Hukum Pidana Dalam Menanggulangi Tindak Pidana Dalam Undang-Undang Metrologi Legal," *Dinamika Hukum* 17, no. 2 (2016), <https://www.unisbank.ac.id/ojs/index.php/fh1/article/view/7187/2171>.

²⁴ Wenny Megawati, Rochmani, and Dian Ratu Ayu Uswatun Khasanah, "Aspek Perlindungan Masyarakat Sebagai Sarana Keefektifan Sanksi Pidana Bagi Pelaku Usaha Di Bidang Metrologi Legal," *Jurnal Masalah-Masalah Hukum* 51, no. 3 (2022), <https://ejournal.undip.ac.id/index.php/mmh/article/view/44208/22569>.

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